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ABSTRACT

The main objective of the desegregation evaluation was to determine how court-ordered desegregation requirements and specially funded desegregation activities influenced the organization and operation of the school system and the achievement of pupils. A number of specific questions were derived from this objective. Have desegregation activities succeeded in desegregating schools and classrooms? To what extent have organizational and instructional changes in schools which have been desegregated been successful? What contributions to desegregation have special programs made? What have been the educational outcomes associated with desegregation activities, with particular reference to student achievement? What strategies have the best chance of handling desegregation problems at the beginning of the next school year? What costs are associated with changes resulting from desegregation activities? Are sufficient materials on the appropriate instructional levels available in the schools involved in desegregation? Has there been an increase in vandalism in desegregated schools? To what extent have programs identified as human relations programs facilitated the desegregation process? (Authors/JM)

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DADE COUNTY PUBLIC SCHOOLS
Division of Instruction

EVALUATION OF DESEGREGATION--1970-71

Prepared by

Department of Program Evaluation
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1410 Northeast Second Avenue
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The evaluation of the 1970 court-ordered desegregation of the Dade County Public Schools was planned in September, 1970. Although the evaluation was concerned with many aspects of the desegregation program, the availability of achievement test scores for all students from the period just prior to desegregation--May, 1970--and the prospect of a second complete set of scores for the same period a year later made achievement a primary focus of the study. In the many months since the plan was first conceived, the basic plan has been greatly elaborated in detail. Many persons have contributed to the plan and have participated in carrying it out. It is difficult to single out a few of them for special mention, but such must be done.

First, the analysis could not have been done without the complex data processing carried out for the department under the direction of Eldon Padgett with the assistance of Michael Supley, who operationalized most of the computer runs, and the participation of Central Data Processing under Daniel Yuhr, with the assistance of Barry Hemphill and Luis Rivas.

Second, Dr. Robert Stephenson and Dr. Phillip Spieth carried out the mammoth task of analyzing the data and writing the results. Dr. Stephenson was responsible for the Preface, literature review, bibliography, and that portion of the analysis dealing with achievement. Dr. Spieth was responsible for the remainder of the data analysis. General supervision, editing, and the Conclusions section were the responsibility of the undersigned.

The communications group under John Ranieri, assisted by Vashti Yaeger, deserves special mention for its efforts in report production.

Because of the extensive contributions made to the study by many members of the Department of Program Evaluation, note is made here of their names without further explanation:

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PREFACE

Experimental Design and Desegregation Studies

In education and the social sciences the focal point of much research is an attempt to assess and establish the validity of the following type of inference: if unit (or person) A is administered treatment 1, characteristic X will likely occur; if unit A is administered treatment 2, characteristic Y will likely occur. The conditions which generally determine the degree of validity attributable to such statements are termed "experimental control." Like other conditions, experimental control varies in degree as well as kind.

Traditional requirements for complete experimental control and maximum validity of inference are four fold. First, the population of units must be accurately identified. Second, control over treatments--control over order, intensity, or duration--must be demonstrated. Third, the population of interest must be randomly sampled and this sample must be broken into subsets which are randomly equivalent. Fourth, these subsets must be randomly paired with the treatment conditions. After a specified quantity or duration of treatment, observations are taken on the characteristic(s) of interest, and the subgroups are compared on the basis of these characteristics.

In desegregation and most other social policy research, the definition and demonstration of control over treatment conditions and the random assignment of pupils to treatment (desegregation) conditions is never achieved, due to social, political, moral and practical considerations.

To the extent that any research project falls short on any of the "experimental control" requirements, the inferences made on the basis of results lack conclusiveness, and their validity becomes increasingly suspect as additional controls are violated. This is particularly true with regard to treatment control and randomization. Obviously, if there is no control over treatments, one cannot be sure what, if any, treatment the experimental units received. As an example, suppose one were to compare traditional and BSCS biology programs, but the BSCS teacher developed her notes and organized class exercises from a traditional biology text. Would it be appropriate to make inferences about the pros and cons of the two curricula from the results of such a study?

Concerning the random assignment of units to treatment conditions, the use of non-randomly-equivalent groups can often be as misleading as informative. One simply cannot match groups on all "relevant" characteristics with a high degree of precision. And any inference based on a comparison of non-randomly-equivalent groups must always be prefaced by the assumption that "the inference is valid if the groups were equivalent before treatment"--an easy assumption to make, but one difficult to validate.

Suppose, for example, that attendance boundaries of two previously segregated schools were modified to produce greater equivalence in student body ethnic compositions. Suppose also that, without knowledge or intent, the boundaries were changed so that higher SES Blacks were moved to the white majority school and lower SES whites to the Black school. If the desegregation process had absolutely no effect, at the end of one year the results would likely "demonstrate" that desegregation resulted in increased achievement for the desegregated Blacks--in comparison to their cohorts remaining at their original school--and decreased achievement for the majority pupils--in comparison to their "remaining" cohorts. And this inference would likely be sustained if each pupil's pretest score were subtracted from his posttest score in order to "adjust" for pretest differences. In actual fact, the differences in both posttest scores and in magnitude of gain would be due not to desegregation, but to the fact that on the average, higher SES pupils gain at a faster rate than low SES pupils.

There are many other sets of conditions which, by virtue of weak experimental control, might operate to produce erroneous inferences about the effects of desegregation. Among these are differential school effectiveness (see for instance St. Johns, 1969) which is a serious problem with our own and numerous other studies; Hawthorne effects, which are most likely to occur in small scale studies in single schools or classrooms; regression effects, which are invariably present when pupils from non-equivalent groups are matched and selected on the basis of pretest scores (see for instance Cain, 1971); differential mortality rates for the desegregated and non-desegregated groups, which may render even initially equivalent groups unequal; and certain types of statistical adjustments attempting to render non-equivalent groups comparable when, in fact, the validity of the adjustment procedures depends on methodological assumptions which are known to be violated (see for instance Rosenfeld and Hilton [1971] who demonstrate that a common covariance adjustment for SES on Black and white students violates the homogeneity of regression assumption). These are simply a few of the problems that may affect the internal validity of desegregation studies.[1]

In attempting to generalize the findings of one desegregation study to other schools and districts, the problems are equally or, perhaps, more serious. There is a good deal more to desegregation processes than simple ethnic mix ratios.

These adjunctive factors, i.e., pupil, parent and teacher attitudes, teacher retraining, curriculum modification, SES mix ratios, may themselves be responsible for the effects that occur or do not occur. Even in a single district, a desegregation effect found at the elementary grades will not necessarily generalize in degree or kind to the junior or senior high schools. Desegregation by busing may not produce effects similar to the pairing or boundary modification of schools. Nor can one logically generalize results from 20 percent Black communities to those that are predominately Black.

Given these restrictions the validity and generalness of research conclusions, one might ask is there anything to be learned from other desegregation studies. The answer is a qualified "yes," and the qualification depends primarily on two factors: the integrity of the research designs and on the consistency of results across many and varied conditions. We shall preface our summary on these two factors. Our intent has been to develop a sense of skepticism concerning our own review and findings as well as those which may have been read elsewhere.

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[1] It was Weinberg's failure to critique and evaluate adequately the integrity of research reviewed in his book that led us largely to ignore his conclusions.

INTRODUCTION

The progress of desegregation in the Dade County Public Schools was summarized in the Department of Program Evaluation's interim report published in May, 1971. In the report, a brief history of desegregation in the Dade County Public Schools was given. This report deals with the same time period, the school year 1970-71. It supplements the earlier report and presents the first comprehensive statement of the effects of the 1970 court-ordered desegregation program on student achievement.

The evaluation of a desegregation program in a large public school system is not a casual task. It has occupied the best efforts of the Department of Program Evaluation for a year. Although some simple generalizations can be made from the analysis, a reader hoping to have a real understanding of the evaluation results cannot approach the report in a casual manner. An understanding of the research background for desegregation and at least a modest grasp of the meaning of the measurements are essential. To that end, we have tried as we go along to supply the essential concepts needed for understanding the results of the report. First was a preface describing some of the design problems in "field" research. Following next is a literature review. In Appendix A is a description of the measurement instruments and an explanation of the statistics employed. These sections are important for the reader who does not have a strong research interest and background but who wants a complete understanding of the desegregation evaluation. The reader who desires a summary of the findings and is not concerned with details should go directly to the "Conclusions" section.

Review of Related Literature

Supposedly, a literature review on a subject clarifies the basic issues and reflects the extent to which these have been resolved. In desegregation there are many issues and few, if any, have been clearly resolved. Of the eighteen years since the historic Brown decision, the first decade yielded little on the effects of ethnic desegregation. The last eight years have evidenced considerable empirical research which has been extensively reviewed by Katz (1964 and 1967), St. John (1969 and 1971), Weinberg (1967 and 1970), and Armor (1972).

Of the seven reviews, the two by Weinberg are probably most accessible--each is in book form; unfortunately, they are also the least accurate (for reasons noted earlier). The seminal reviews on the relationships between desegregation and achievement are St. John's (1969 and Armor's (1972). Katz's reviews (1964 and 1967) are broader in scope dealing with, in addition to achievement, the psychological and social psychological effects of desegregation.

Before summarizing the general trends in the research results, it is necessary to point out several characteristics of the desegregation studies reviewed. First, with the exception of a five-year study reported by Armor (1972), there apparently have been no longitudinal studies of the effects of desegregation beyond one or two years. Excepting Cain's (1971) "self-report" study, no study was found that examined the actual post school, or "real world," performance of minority groups as related to either the intensity or length of desegregated school experiences. The long-term educational effects and the effects on extent and style of adult social and economic participation are the crucial questions in determining the effectiveness of ethnic desegregation, and these questions have yet to be definitively stated in operational terms--much less answered.

Second is the complexity of the desegregation process itself and the extent to which this complexity is adequately represented in the literature. No study or group of studies has adequately addressed this complexity in a holistic fashion. Hence, the generalizations drawn from the current research must be, as in the research itself, somewhat piecemeal and equivocal.

In much of the desegregation research, student achievement is typically represented by standardized test scores such as the Stanford or Metropolitan Battery. These scores are typically in grade-equivalent units. Pupils of Japanese- and Chinese-American, and Jewish ethnic origin on the average were found to score slightly higher than their white majority, or Anglo, grade cohorts. Mexican- and Spanish-American, Black-American and American-Indian pupils typically score considerably lower than majority pupils (Coleman et al., 1966; Katz, 1964; St. John, 1969; and Weinberg 1970). Based on cross-sectional studies, the average Black student's (and to an extent, other low-scoring minority pupils) test performance falls in grade-equivalent units further below that of the majority group as the number of years in school increases.[1] No research was found that indicated a reversal of this pattern as a function of ethnic desegregation.

The same minority ethnic groups that score lowest on standardized test performance also, on the average, come from homes of lower educational and socioeconomic backgrounds. Further, statistical controls for the influence of family background cannot generally be used to "equate" the groups, as background characteristics do not relate to student achievement consistently across the various ethnic groups (Rosenfeld and Hitton, 1971; St. John, 1969).

In summarizing the effects of ethnic segregation and desegregation, it is convenient to distinguish between those studies conducted in the South and those conducted in other regions. Ample evidence exists (Levine, 1969) that the cultural parameters of southern and non-southern Blacks are different. More importantly, the vast majority of desegregation studies reported in the literature reviews have been conducted in the metropolitan Northeast, mid- and far-West.

It is also necessary to distinguish between those studies conducted in or before the middle 1960's and those conducted later, as later studies indicate the possibility of different "desegregation" effects than those found by earlier studies.

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[1] Longitudinal studies are somewhat equivocal on this point. See, for instance, Rosenfeld and Hilton, 1971.

Studies through the middle 1960's conducted outside of the South generally indicated that if pupils from lower SES backgrounds attended schools where the majority of their classmates come from substantially more advantaged backgrounds, the achievement of the lower SES pupils often tended to increase slightly (Coleman, et al., 1966; Katz, 1967; St. John, 1969; and Weinberg, 1967). Minority pupils from disadvantaged backgrounds, in particular, appeared to be susceptible to the higher-SES-peer-group influence. But in no case were the SES-cohort effects as important as family background SES effects.

Studies on desegregation and Black achievement in the South indicate a different result. A reanalysis of the Coleman data (Mosteller and Moynihan, 1972), Cain's (1971) self-report study, and an early study on desegregated Louisville, Kentucky schools (Stallings, 1959) indicate that in the South achievement of Black pupils is higher in predominately Black than in predominately white schools.

Whether or not the difference in southern and non-southern results are artifactual remains to be determined. In any case, the studies suggest the possibility that desegregation effects may differ by region. Unfortunately, with the exception of Cain's (1971) work, no current study for southern desegregation was found.

A recent series of studies by Armor (1972) conducted in five northern metropolitan areas indicate a substantially different set of conclusions than those from the earlier data. Using a pre-post design with a one- to five-year interim, he compared the performance gains of Blacks bused to middle-class, predominately white schools with that of equivalent groups of Blacks remaining in predominately Black schools. At the end of from one to five years of desegregation, the performance of the desegregated Blacks did not differ statistically from that of their segregated cohorts. A series of similar studies on the Denver, Colorado and Riverside, California Public Schools (Koeppe, 1972; Singer, 1971) indicated no difference in achievement for desegregated and non-desegregated minority pupils.

Armor suggests that the lack of a "desegregation effect" on Black achievement is due to an increase in ethnic identification which results, in part, in the Black pupils' refusal to accept their white, middle-class peers as educational achievement role models. It remains to be seen whether or not the absence of the middle-class cohort effect will be a consistent occurrence of other concurrent research. Also unanswered is whether or not similar results would occur in lower SES white schools. In any case, Armor's results call into question the only major desegregation benefit consistently established by research conducted in the early and middle 1960's considering the effects of ethnic desegregation on minority pupils' achievement.

Results for majority white pupils are rather consistent: on the average, the majority pupil's achievement appears to be unaffected by desegregation. There are occasional, isolated instances of other "effects." Also, there is little research bearing directly on the white pupil's achievement when, by virtue of desegregation, the majority of his classmates are Black or Mexican-American.

In this context, the phenomenon known as "white flight" warrants mention; "white flight" is the term applied to the exodus of white or majority pupils from the public to private schools when the former are "desegregated" primarily due to changing neighborhood ethnic compositions. Comprehensive data on the rate of the exodus as a function of ethnic mix ratios were not found. Conversations with researchers in other large public school systems, however, indicate that if minority pupils make up 20 percent or less of the individual school's population, the majority loss is small. When the minority ratios increase above 20 percent, the flight rate increases sharply with each percentage increase in the minority composition. Presumably, majority pupils from the more affluent backgrounds have the greater exodus rate because their parents can better afford private school tuitions. These data, of course, remain somewhat speculative, and vary, apparently, with time and circumstances.

Attitudes toward desegregation are associated with sex, level of education, economic affluence, and race. Attitude surveys indicate (Holtzman, 1972; Jensen, 1970; and Katz, 1967) that a majority of Americans favor school desegregation as an abstraction, females more frequently than males, higher SES individuals more frequently than lower SES individuals, and Blacks more frequently than whites. When questions are stated in terms of specific mechanisms, i.e., busing or pairing schools to achieve school desegregation, no group consistently favors any method of implementation. Busing, in particular, has failed to achieve wide support from large segments of the population.

Beyond very simple attitude surveys, little empirical evidence is available on other-than-achievement correlates of school desegregation. No study was found that assessed kind or quality of curriculum modification used or needed as a function of desegregation. The possible need for new and different teaching skills beyond human relation training has apparently received little or no attention in desegregation research.

Correlations between "self-reported" desegregation school experiences and Blacks' aspirations, ethnic attitudes and ethnic mix in post-school conditions are reported by Cain (1971). From a survey of 1,600 adult Blacks, Cain found that Blacks reporting attendance in integrated schools, compared to those attending predominately Black schools, had more white friends, were more trustful of whites, were more likely to have graduated from high school and to have attended college, were more likely to live in integrated neighborhoods and had a higher sense of perceived environmental control. This latter finding is also reported by Wilson (1967).

While Cain's study was cross-sectional and based on self-report, Armor (1972) addressed many of the same questions on a pre-post basis (control and experimental groups). One of the control groups was composed of the siblings of desegregated Blacks, hence, introducing automatic SES controls. Like Cain, Armor found that Blacks attending (bused to) desegregated schools were more likely to attend college, but were also more likely to drop out; at the sophomore year the percentages of control and desegregated students remaining in school were virtually identical. Armor reports, however, that the desegregated Blacks attended colleges and universities of higher academic caliber than those attended by the controls.

Armor also compared the multiple control and bused groups on changes in educational and occupational aspirations, self-concept, racial and busing attitudes and achievement motivation. On each attribute, the bused students gained no more and often less than the controls. Bused Blacks became less favorable toward busing and more favorable toward racial solidarity than the controls. Black students with high aspirations were especially prone to favor Black separation after prolonged desegregation experiences.

On the basis of his studies, Armor makes the following observations about busing and school desegregation.

> " . . . we should caution that the measures discussed here do not necessarily indicate overt racial hostility or conflict. The polarization that we are describing . . . is characterized by ideological solidarity and behavioral withdrawal. . . . The positive effects (of the programs in toto) are limited to the college bound, so that there still may be a question about the benefits of integration for the non-college bound black student. . . . wholesale integration without regard to achievement levels of white and black students can lead to potentially frustrating experiences. Some selectivity might be desirable so that both groups reflect a similar achievement capacity. . . . full education of both groups about the possibilities and causes of differences might ammeliorate the kind of polarization that would endanger the (integration) program (1972, 29, 43, 45, 46)."[1]

In summary, the scope of the desegregation research is limited. Many issues have not received adequate attention. Of those issues having received attention, primarily short-term analyses of desegregation and achievement, research design and methodology inadequacies preclude many studies from serious consideration.

Concerning achievement per se, there is little or no evidence that moderate desegregation is detrimental to the majority pupils' academic performance. But evidence is lacking on white pupils' performance when they become the school's ethnic minority. For Blacks and other ethnic minorities, the achievement-desegregation relationships are even less clear. The research up through the middle 1960's, on the average, indicated a moderately positive effect on Black achievement. However, this effect was found (St. Johns, 1969) to be more consistent with SES (middle-class-cohort) effects, than ethnic mixing per se. Research in the late 1960's and early 1970's reported by Armor (1972) indicates no achievement effect, and calls into question the current validity of the middle-class-cohort effect as a mediator of Black academic performance. Whether or not Armor's results can be generalized outside of the metropolitan Northeast remains to be determined.

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[1] The portions in parentheses are added.

At the national level, the majority of Americans appears to support ethnic desegregation, but a concensus on any immediate method of implementing desegregation apparently is lacking.

Concerning the relationships between desegregation and Black aspirations, self-concept, and attitudes, the results are quite different from one to another study. It is not so much that the results are inconsistent as it is that they vary with so many adjunctive factors as to make a simple generalization very difficult.

CONCLUSIONS

The main objective of the desegregation evaluation was to determine how "court-ordered desegregation requirements and specially funded desegregation activities influenced the organization and operation of the school system and the achievement of pupils.[1]" A number of specific questions were derived from this objective. Each will be answered in turn.

Have Desegregation Activities Succeeded in Desegregating Schools and Classrooms?

The court orders were carried out successfully. Details of the analysis are presented in the interim desegregation evaluation published in May, 1971. Later figures indicate that the ongoing adjustment process has maintained student desegregation within the same 1970-71 range for the system as a whole. Teacher desegregation has also been maintained, with only a slight reversal from the 1970 level. The interim evaluation indicated no systematic racial bias in the assignment of students to classrooms.

To What Extent Have Organizational and Instructional Changes in Desegregated Schools Been Successful?

Organizational changes have been very successful. The school system is an experienced, complexly structured, highly decentralized organization that responds with remarkable resiliency to internal and external stress. The desegregation program proved to be within its capability of adjustment, granted the general cooperation of the community.

Instructional changes have not been as successful. The problem here is not one of rearranging an existing system by utilizing existing mechanisms. Basic changes in the instructional techniques employed for a lifetime by experienced teachers were required. The current state of the art offered no packaged solutions, no real instant-adjustment formula.

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[1] Program Evaluation Plan 1970-71, Division of Instruction, Dade County Public Schools. January 1, 1971.

Principals and teachers tried many techniques to adapt to instructional problems magnified many times by the concentrations of pupils having divergent cultures, highly variable abilities, and mixed educational backgrounds. Individualized instruction became a necessity. Frequently, though, well-intentioned changes ended up looking much like what was going on before. Judging from all sources of data, much remains to be done with instructional procedures, not just in Dade County, but in American education, before we can see the first signs of bridging the achievement gap between advantaged and disadvantaged youths.

What Contributions to Desegregation Have Special Programs Made?

Special programs made significant contributions to the desegregation process by adding personnel to ease areas of stress. Included were additional teachers, assistants to the principals, aides, and so on. Some of the funds supporting these special programs were especially budgeted for desegregation, other were available through the normal special program channels serving compensatory education purposes.

What Have Been the Educational Outcomes Associated With Desegregation Activities, With Particular Reference to Student Achievement?

Differences in student achievement associated with desegregation of teachers or students have been relatively minor. To the extent that a trend existed at the end of the school year 1970-71, it was negative with respect to desegregation in the elementary schools. Black students in formerly all-Black or nearly all-Black schools did best when they stayed in schools most nearly like their former schools in ethnic composition. The same was true for Spanish-language-origin students and "other" (white majority) students: they were more likely to make or exceed the scores expected for them when they stayed in schools with high concentrations of their own ethnic types. This finding is evident in other desegregation studies involving southern schools, and may be a regional characteristic. The evidence is too sketchy at this point to present the finding as more than a hypothesis for further investigation.

In junior high schools, for all ethnic groups, scores were substantially below expected, becoming more so as the percentage of Black students in the schools increased. This particular finding may be associated with the fact that the junior high schools had the most difficulty in assimilating desegregation.

At the senior high school level, an analysis of change was impractical because of the smaller number of schools and the lesser degree of change in 1970-71 (the high schools having experienced desegregation earlier). It was possible to examine how much progress students were making in senior high schools with various levels of racial concentration, although the range of concentrations was very restricted. Based on the scores expected from the prior year's scores, we found that students regardless of ethnic origin tended to make more progress in schools with higher concentrations of Black students. It should be accented that these differences were small and, because we were dealing with status rather than change, could be the effects of factors other than racial composition.

In summary, differences in relative achievement gains differed for the three educational levels. At the elementary level, students tended to do better in ethnic groups similar to their own. In junior high, where the greatest change took place, they tended to do better in schools with higher concentrations of white students. At the senior high level, where desegregation was already a fact, they were found to be doing better in schools with higher concentrations of Black students. By "doing better," we mean the students were tending to exceed the scores expected on the basis of the prior year's scores. By using the word "tending," we mean to indicate that the results were not highly conclusive and contained many exceptions. Finally, we should note that the basic achievement differences between white and Black students were not appreciably changed one way or the other by effects associated with desegregation in 1970-71. The gains or losses discussed were not large enough to make an important impact on pre-existing differences.

What Strategies Have the Best Chance of Handling Desegregation Problems at the Beginning of the Next School Year?

Activities being employed to handle desegregation were described in the interim report published in May, 1970. It is in the techniques for handling desegregation that the decentralized nature of the school system becomes obvious. Each problem was approached on an individual basis and a unique solution was applied. The techniques employed were those normally employed in the school setting, beginning with the teacher's handling those problems he could handle at that level, passing on to the principal any problem beyond his scope. The principal could draw on district personnel if the problem was too big for him to handle. From there, the county level of administration could be called in. The resources that were available were not usually different in kind from those normally available, but were greater in magnitude. Community and student relations were regarded as especially important, however.

What Costs Are Associated With Changes Resulting From Desegregation Activities?

Those costs were estimated at $5,000,000 for the 1970-71 school year.[1]

Are Sufficient Materials on the Appropriate Instructional Levels Available in the Schools Involved in Desegregation?

Inappropriate instructional materials was one of the most significant problems encountered. As logic would dictate, the problem increased at each higher grade level so that substantial problems were found at the junior and senior high school levels.

Teachers at the junior high school level were most likely to turn to individualized instruction and linguistic reading programs to deal with reading deficiencies. Observation showed, however, that instructional materials above the student's level of comprehension were frequently found to be in use. In many instances, the problem was not one of availability but of choice.

Has There Been an Increase in Vandalism in Desegregated Schools?

We were unable to obtain sufficiently valid data to answer this question. It appeared, however, that vandalism viewed from the point of total numbers of instances was little related to the 1970-71 desegregation program. A dollar value analysis was not possible.

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[1] Interim Evaluation Report. Desegregation. Department of Program Evaluation. May, 1970.

To What Extent Have Programs Identified as Human Relations Programs Facilitated the Desegregation Process?

In general, our investigation did not disclose any evidence that the Human Relations programs contributed directly to the general success of the desegregation program. Most principals participated in human relations training of varied nature prior to or during desegregation. Teachers also participated in human relations training, which included instruction in new teaching techniques. A human relations team had apparent success when it was employed at the school staff level, but its services were not generally used by schools having the greatest degree of desegregation. More traditional channels for handling problems were seemingly preferred by principals.

RESULTS

Effects of Desegregation on Achievement

At the beginning of the school year 1970-71, a massive student desegregation program was carried out in the Dade County Public Schools. This followed a teacher desegregation program in February of the prior year. Both desegregation efforts were the results of court order.

Segregation, desegregation, and resegregation are processes, not static states. The processes are influenced by many major conditions: housing patterns, economic conditions, laws, and cultural divergencies, to name a few. Some factors are racial in nature, others are socio-economic, political, religious, and psychological. Any specific desegregation program interacts with these factors, making it extremely difficult to separate effects due solely to the desegregation program.

In this study, we have frozen the processes at two points in time--May, 1970, prior to the court-ordered student desegregation program, and May, 1971, at the end of a school year of the student desegregation program. In this section, we concern ourselves only with achievement in reading and mathematics during that period. Most of the analysis concerns the elementary and junior high schools, since senior high schools had already achieved a certain amount of desegregation prior to 1970.

Essentially, the design is of a pre- and a post- nature. The 1969-70 achievement data represent the relationship between ethnic group mixes and student performance prior to the 1970 pupil desegregation court order. The 1970-71 data represent the relationship between pupil desegregation and academic achievement after the 1970 court decision. As there was considerable desegregation prior to the 1970 court order, data from the two concurrent school years provide information concerning the association between increased levels of ethnic desegregation and pupil academic performance.

The presentation of the results of the analyses moves from the general to the specific. In the initial presentation, the mean achievement level of the system's pupils is given for 1969-70 and 1970-71 by grade. Following that, the average academic performance of the three major Dade County ethnic groups--Black, Spanish-language-origin, and others (majority white)--for both 1970 and 1971 are presented in tabular form. These tables provide a comparison over the two academic years of both the county's academic performances and the academic performance of each of the three ethnic groups.

After presenting the academic performance levels of the three ethnic groups by grade, performance graphs are presented as a function of the desegregation rank of the school which the pupil attended. Desegregation rank is more or less equivalent to the percentage of the school's students who are Black. The ranks range from zero to 11, zero representing virtually no or very few Black students, 11 representing virtually all Black, with 10 percent increments between zero and 11. These graphs are presented for all pupils and for the three ethnic students' groups individually. The purpose of these graphs is to determine the association between percent Black in school and the performance of all pupils as well as that of the three ethnic groups individually.

The final set of graphs represents a further breakdown in the data. In these graphs, students are divided into quarters based on their 1970 test performance. The first quarter is comprised of the top 25 percent of students at each grade level. Those in the second quarter are the next highest 25 percent of the 1971 scorers, and so on for the third. In the fourth quarter are found those students who constituted the lowest scoring 25 percent in 1970 May testing. Quarters are computed within each grade level. In these graphs performance is presented for each ethnic group by quarter for each desegregation rank and for each grade. These graphs are used to investigate the possibility that the effect of the desegregation rank of the school the pupil attends is different for pupils who in the past have evidenced different levels of educational attainment. In technical terms, this is a question of the interaction between the 1969-70 level of performance and the 1970-71 percent Black in the school upon the 1970-71 level of student performance.

The final analysis is the most sensitive measure of the effect of the 1970-71 desegregation program upon achievement in basic subjects. The analysis treats the data by grade, by ethnic group, by level of desegregation for the two concurrent school years. It investigates the relationship between change and/or stability of ethnic mix and the average pupil achievement.

Description of the Analytical Procedures

Many readers will want to obtain a clear idea of the methodological respects of the study--variable definitions, test descriptions, measurement procedures--before proceding. These readers should now turn to the Appendix and read the section headed "Methodology."

Countywide Achievement, May 1970--May 1971

In the following two graphs, countywide reading and mathematics achievement, May 1970 and May 1971, is presented by grade.

These graphs reflect over the one-year period the similarity of achievement performance across all ethnic groups. Visually, there appears to be little difference in performance from 1970 to 1971, though in the elementary grades 1971 mathematics performances do appear to be slightly elevated in comparison.

As the graphs reflect neither ethnic differences per se, nor performance of necessarily "similar" students over the two years, the graphs represent only systemwide comparability over the two years. The nature of these results, however, leads us not to expect systemwide gains in achievement as a result of the desegregation program, with the possible exception of the area of mathematics in the lower grades. That possibility will be investigated in detail in later sections of the report, along with differential ethnic group performance and 1970 to 1971 student gain.

Black and Non-Black Achievement by Grade

As noted in the literature review, on the national level, the performance levels of Black and several other groups of majority pupils tend to become more discrepant at each successive grade. At grades one and two, Blacks typically score only slightly below majority pupils when performance is measured in grade-equivalent units. At grade twelve the

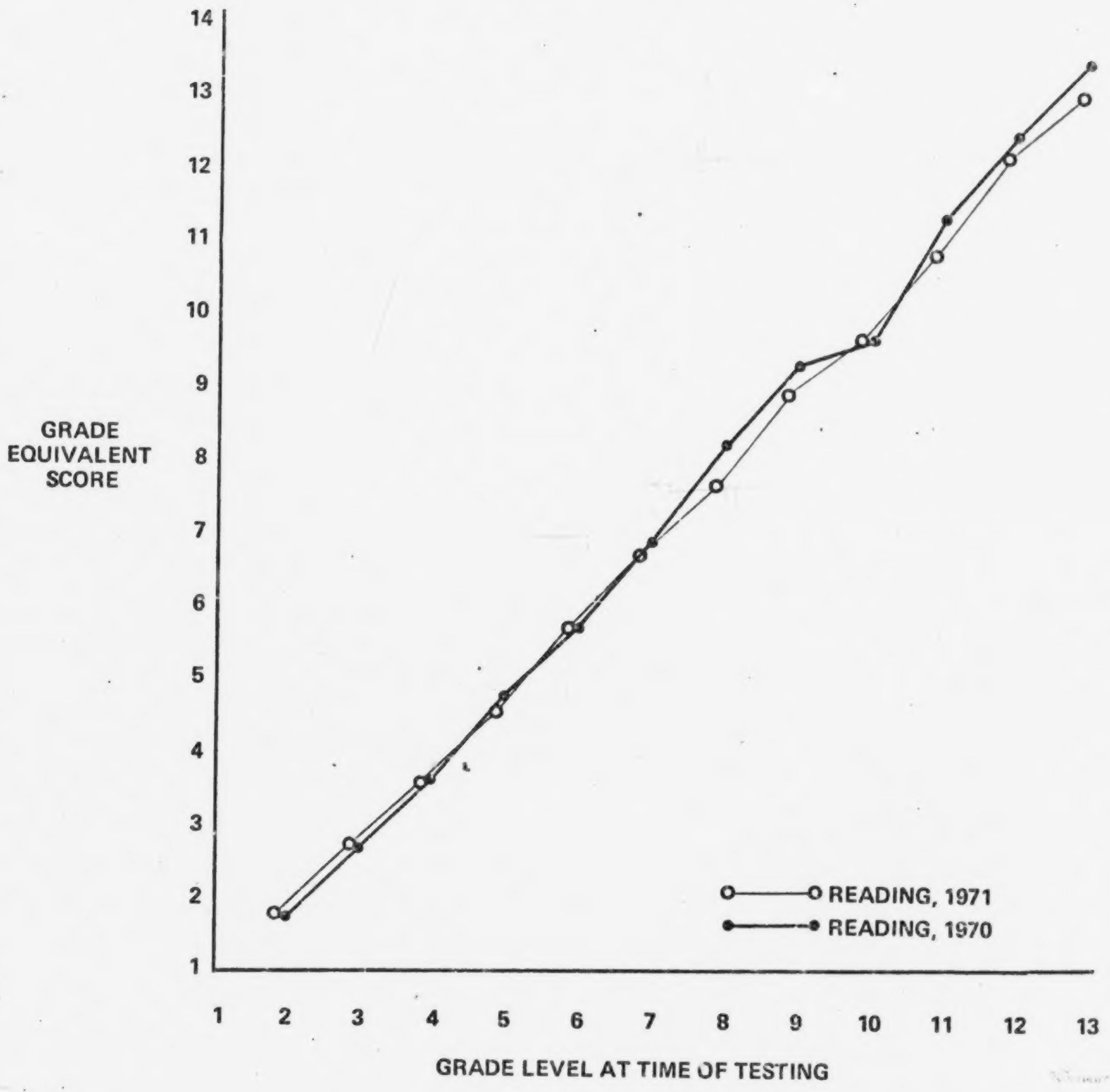

Fig.1 [1]—Comparison of mean achievement of Dade County Public School students, May, 1970, versus May, 1971. For purposes of comparison, scores of one senior high school not listed in 1970 have been removed from the 1971 totals. Testing in early May, 1971, was one-tenth of an instructional year earlier than testing in late May, 1970; thus the two sets of points are spaced slightly differently along the horizontal axis.

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[1] From Achievement in the Dade County Public Schools, 1970-71. Department of Program Evaluation. November, 1971.

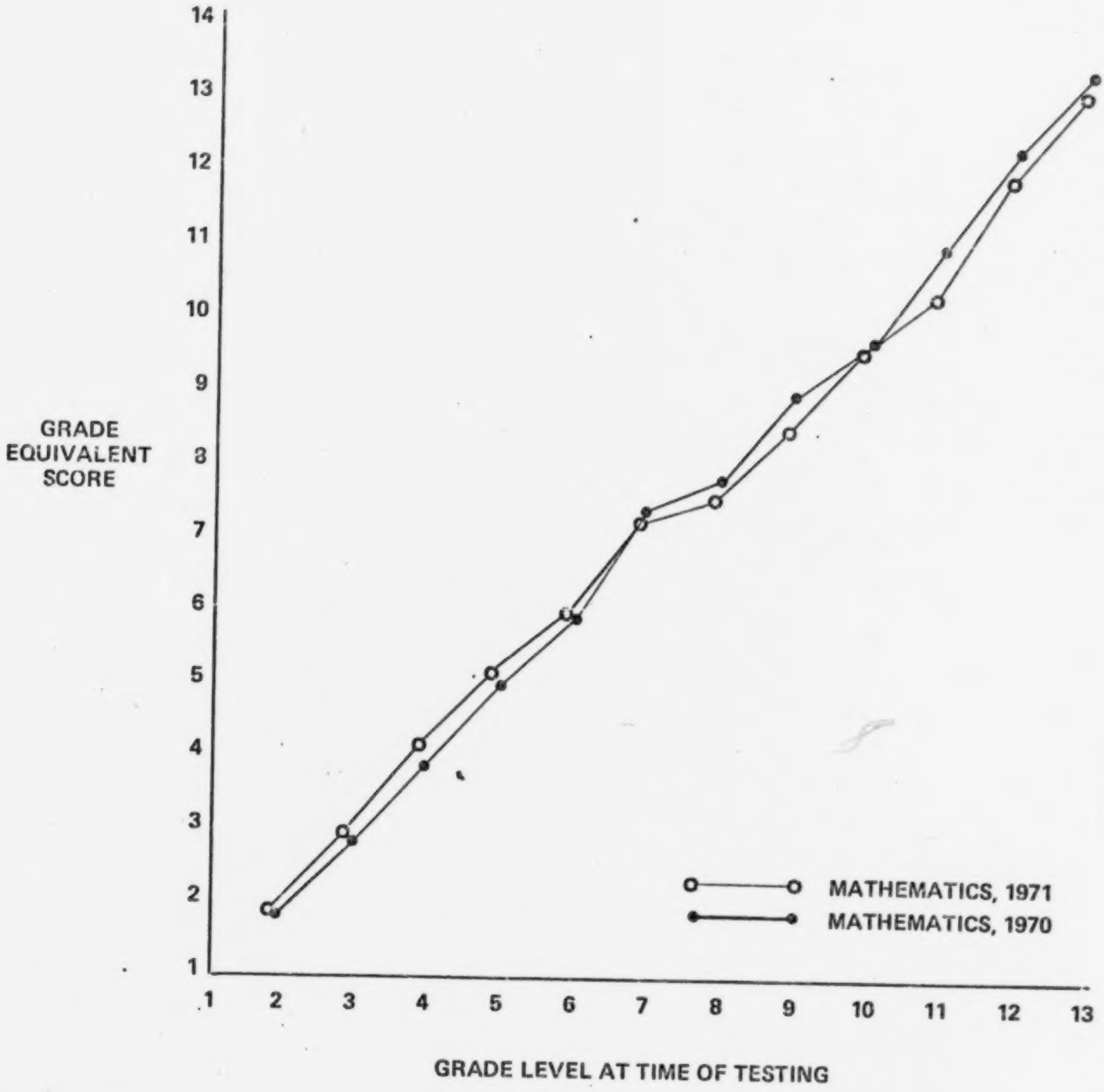

Fig.2[1]—Comparison of mean achievement of Dade County Public School students, May, 1970, versus May, 1971. For purposes of comparison, scores of one senior high school not listed in 1970 have been removed from the 1971 totals. Testing in early May, 1971, was one-tenth of an instructional year earlier than testing in late May, 1970; thus the two sets of points are spaced slightly differently along the horizontal axis.

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[1] Ibid.

discrepancy is considerable, ranging in large metropolitan districts from two to as much as five years. Also noted in the review was the fact that no desegregation study was found that indicated a reversal of this pattern.

In the following graph, the Black and non-Black performance averages are plotted for 1971, grade-equivalent units against grade level. Consistent with the national pattern, the countywide data also indicate an increasing discrepancy with higher grade levels.

Several additional features of the graph warrant mention. Note first that the graph reflects cross-sectional and not longitudinal data. Inferences concerning the progress of pupils through successive grades cannot be made on the basis of cross-sectional data.[1] Note also that the spread of scores increases with grade level so that the grade-equivalent difference between any two fixed percentile scores increases at each higher grade level. Finally, irrespective of the score discrepancies for both groups, higher levels of performance are achieved at each successive grade level. There is no point at which performance "flattens out" for either group.[2]

Achievement for Three Ethnic Groups

In Table 1 countywide reading and mathematics achievement for May 1970 and May 1971 grade cohorts is presented for the three ethnic groups. The means indicate the comparative levels of performance for the three ethnic groups and the differences in achievement across the successive grade levels.

Change in performance from grade 6 to 7 and 9 to 10 should not be treated literally--especially for Blacks on arithmetic--as these are the grades where test levels change, causing several types of linkage problems discussed in Appendix A, Methodology. While means are reported for all grade levels, we shall limit our discussion to the elementary grades where linkage problems are not serious.

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[1] For a significant longitudinal study of Black and non-Black performance, see Rosenfeld and Hilton (1971).

[2] For grade means for the ethnic groups to be shown later, this statement is not unequivocally true for Blacks' arithmetic achievement in high school. The lack of gain in this particular case is due to a change in test form and the grade-equivalent norming procedure and does not reflect, we believe, a grade to grade decrement.

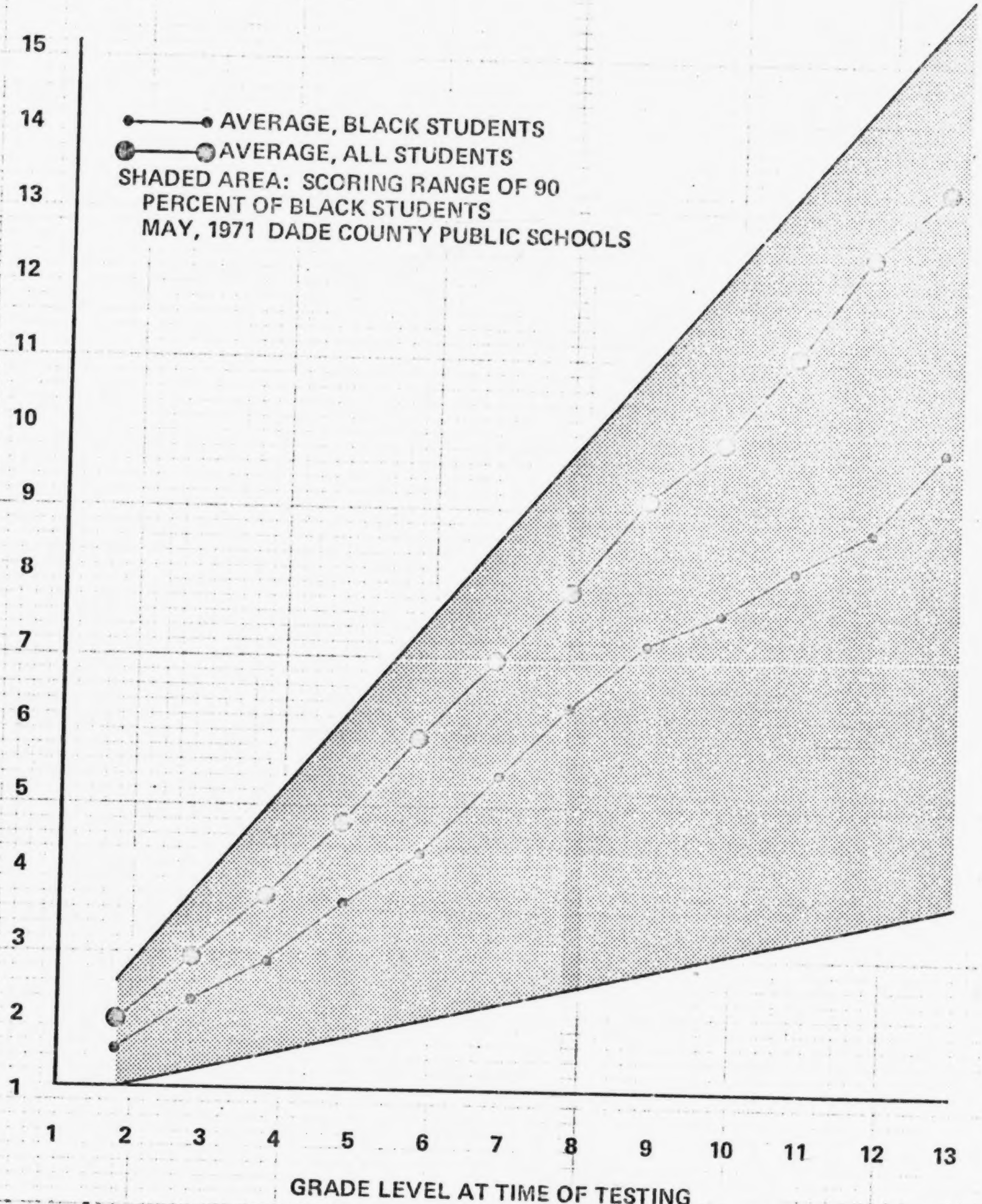

Fig. 3[1]—Comparison of mean achievement of Black students by grade level with mean achievement of all students, with an indication of the range of scores within which 90 percent of all Black student scores fall. An additional 5 percent of all Black students score above the shaded range, another 5 percent below.

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[1] Ibid.

TABLE 1

1970 AND 1971 ACHIEVEMENT BY GRADE FOR EACH OF THREE ETHNIC GROUPS

GRADE	READING						ARITHMETIC					
	OTHERS		SPANISH		BLACKS		OTHERS		SPANISH		BLACKS	
	70	71	70	71	70	71	70	71	70	71	70	71
1	1.95	1.98	1.64	1.71	1.56	1.67	2.12	2.15	1.86	1.85	1.51	1.61
2	3.10	3.10	2.43	2.45	2.18	2.22	3.08	3.21	2.83	2.97	2.34	2.59
3	4.23	4.18	3.23	3.28	2.71	2.77	4.35	4.47	3.95	4.14	3.02	3.26
4	5.46	5.29	4.41	4.19	3.67	3.55	5.42	5.64	5.12	5.27	4.08	4.22
5	6.60	6.56	5.37	5.37	4.17	4.46	6.44	6.43	6.10	6.05	4.83	5.10
6	7.81	7.72	6.64	6.36	5.08	4.98	8.12	7.94	7.55	7.40	5.71	5.76
7	9.26	8.76	7.87	7.26	6.12	5.80	8.48	8.14	7.80	7.45	6.30	6.12
8	10.46	10.06	8.59	8.28	6.95	6.56	9.60	9.37	8.69	8.44	7.03	6.78
9	10.74	10.84	8.89	8.95	7.19	7.26	10.47	10.50	9.46	9.38	7.41	7.28
10	12.74	12.01	9.97	10.13	7.98	7.89	12.87	12.15	9.54	9.51	5.79	5.37
11	13.72	13.51	11.52	11.20	8.53	8.71	14.18	13.78	11.03	10.61	6.34	6.17
12	14.77	14.21	12.39	12.31	9.59	9.57	15.20	14.90	11.73	11.99	7.56	7.00

One particular type of pattern is of interest. For any 1970 score column, the difference between adjacent grade means provides an estimate of the grade-to-grade difference prior to implementation of the pupil desegregation court orders.

For instance, in 1970 "Others" in the first and second grades scored 1.95 and 3.10 respectively on reading, a grade-to-grade difference of 1.15 grade-equivalent units. The vast majority of 1970 first graders were also 1971 second graders. By comparing the 1970 first-grade mean with the 1971 second-grade mean, one has an estimate of the grade-to-grade growth--1.95 to 3.10 = 1.15--which occurred after the court orders were implemented.

In the present example, the grade-to-grade difference and grade-to-grade growth scores are identical. In other grades and for other ethnic groups, the difference and growth scores will vary somewhat. Of interest is whether or not they tend to form a pattern--one being consistently and substantially larger than the other--by ethnic group.

Inspection of the growth and grade differences for the elementary grades reveals only one consistent and substantial pattern. For Black pupils' arithmetic achievement, the growth differences are consistently larger than the grade-to-grade differences. For other ethnic groups, the differences appear random.

Whether or not the "higher" Black arithmetic achievement is related to desegregation cannot be determined at this level of analysis. The increase may be due to sources other than desegregation, i.e., special programs, teacher shifts (which might have lowered the 1970 Black achievement by disrupting the 1969-70 school programs in predominately Black schools), or it might be due to changes in student body composition. In any case, this result causes us to pay particular attention to Black arithmetic achievement in later analyses.

1971 Actual Minus Predicted Means for Three Ethnic Groups by Grade

In this section we examine the 1971 actual minus predicted (A-P) means for Other, Spanish-language-origin (SLO), and Black pupils. Both reading and arithmetic scores are reported for each grade. Of interest is whether or not there were differential levels of achievement for the three ethnic groups (Figures 4 and 5).

On reading at the elementary grades, all ethnic groups averaged above their predicted levels, Black and SLO pupils somewhat more than Others.

At the junior high grades, the performance of Black and SLO pupils dropped with each grade increase. At grade nine, all groups scored below their predicted levels of achievement. This latter occurrence and the entire senior high patterns are due at least in part to linkage and grade-norming problems mentioned earlier.

For arithmetic the A-P achievement tends to decrease with increasing grade levels. At the elementary grades all ethnic groups averaged above predicted. The ethnic groups, however, are less well differentiated in arithmetic performance than in reading performance.

The "drop" in scores at grade 7 are due to a level change in the Stanford Battery. The drop at grade 10 for SLO and especially Black pupils is due to both a change in test level and problems with the age-grade norming procedure which occur at the higher grades. These two sources of inconsistency essentially interact with the A-P computational formula to produce inaccuracies for low scoring pupils. Hence, the A-P results for tenth-grade pupils (especially in arithmetic achievement) should be interpreted with special consideration to this problem. At other grade levels, the A-P scores, we believe, are reasonably representative of unusual performance, high or low.

The plotted scores must also be interpreted in light of the number of students represented. When few students are represented, the size of random fluctuations will increase. For example, a point is plotted for "other" students in the "almost-all-Black-students" category. This point may represent as few as 20 students across the county.

ACTUAL MINUS PREDICTED ACHIEVEMENT FOR THREE ETHNIC GROUPS BY GRADE

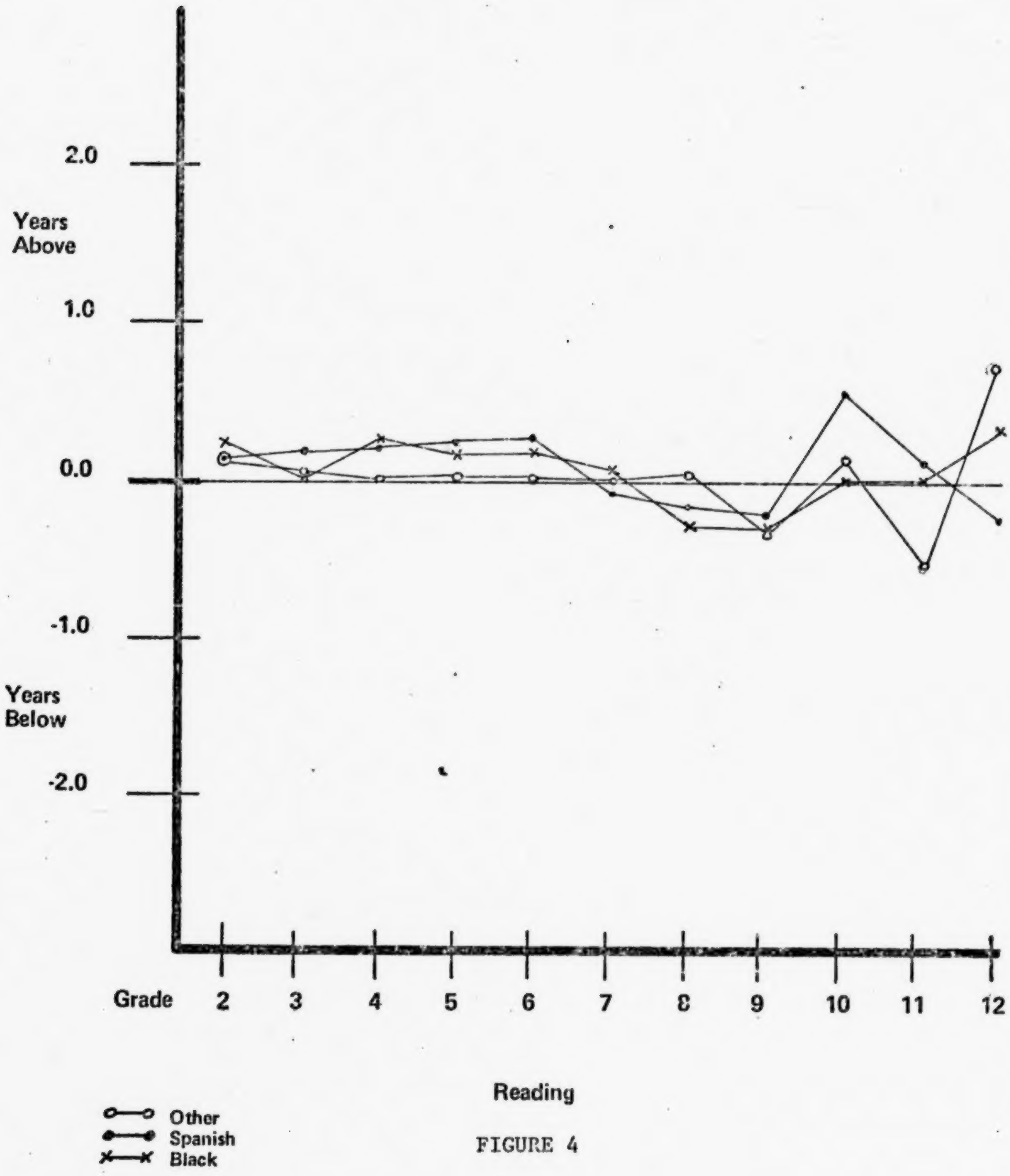
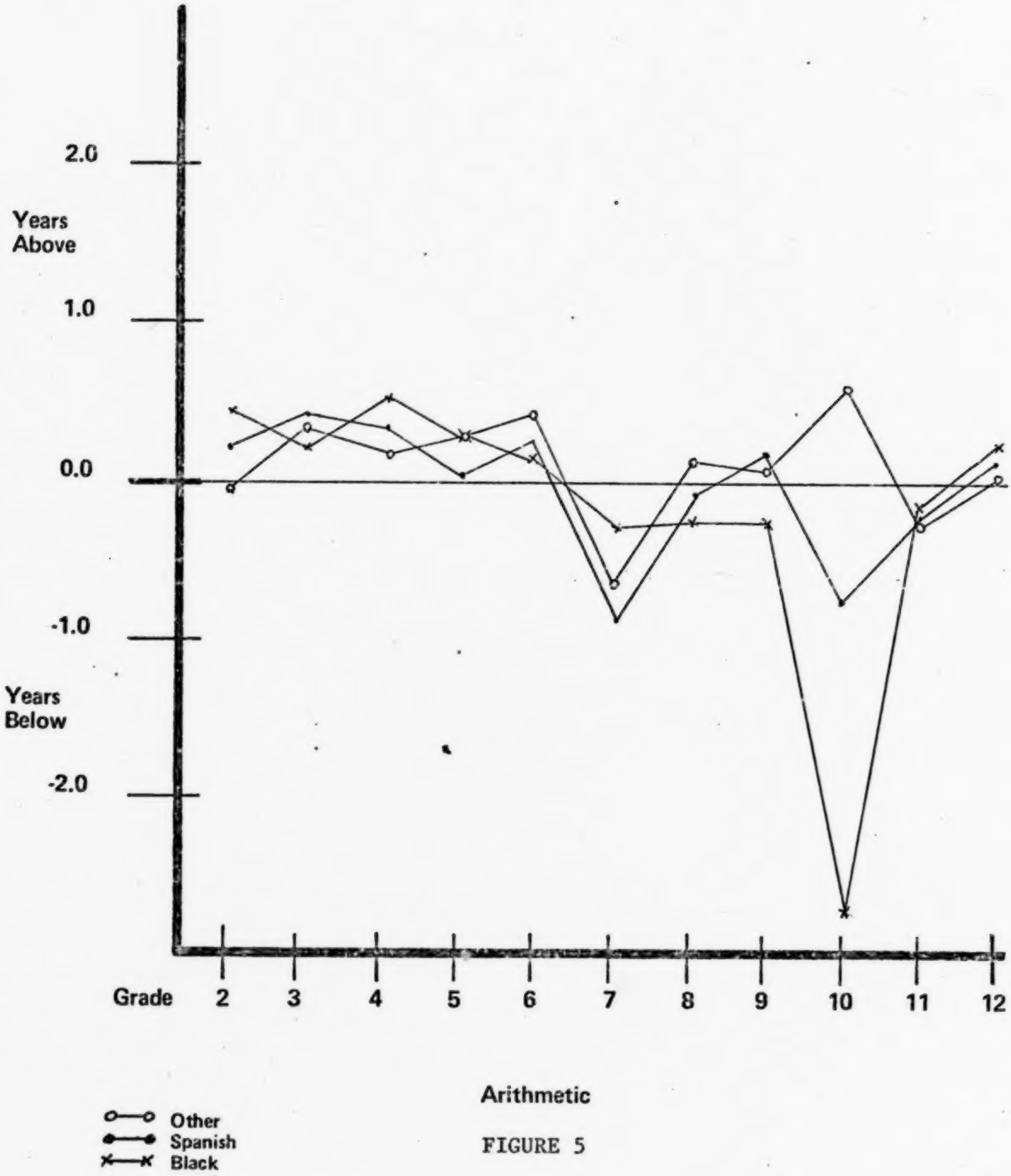


FIGURE 4

ACTUAL MINUS PREDICTED ACHIEVEMENT FOR THREE ETHNIC GROUPS BY GRADE



Arithmetic

FIGURE 5

Grade Equivalent Achievement and 1971 School Desegregation Rank

In this section are presented the graphs for May 1970 and May 1971 grade-equivalent achievement by 1971 school desegregation rank. There is one graph per grade per type of achievement, yielding 24 graphs in total. Means of school means rather than pupils are computed for each individual desegregation rank (DR). Hence, the points on the graphs do not necessarily reflect either the same number of pupils or the achievement average of all pupils in schools of any given DR. A school with 125 first graders receives the same weight in the averaging process as one with 200 first graders.

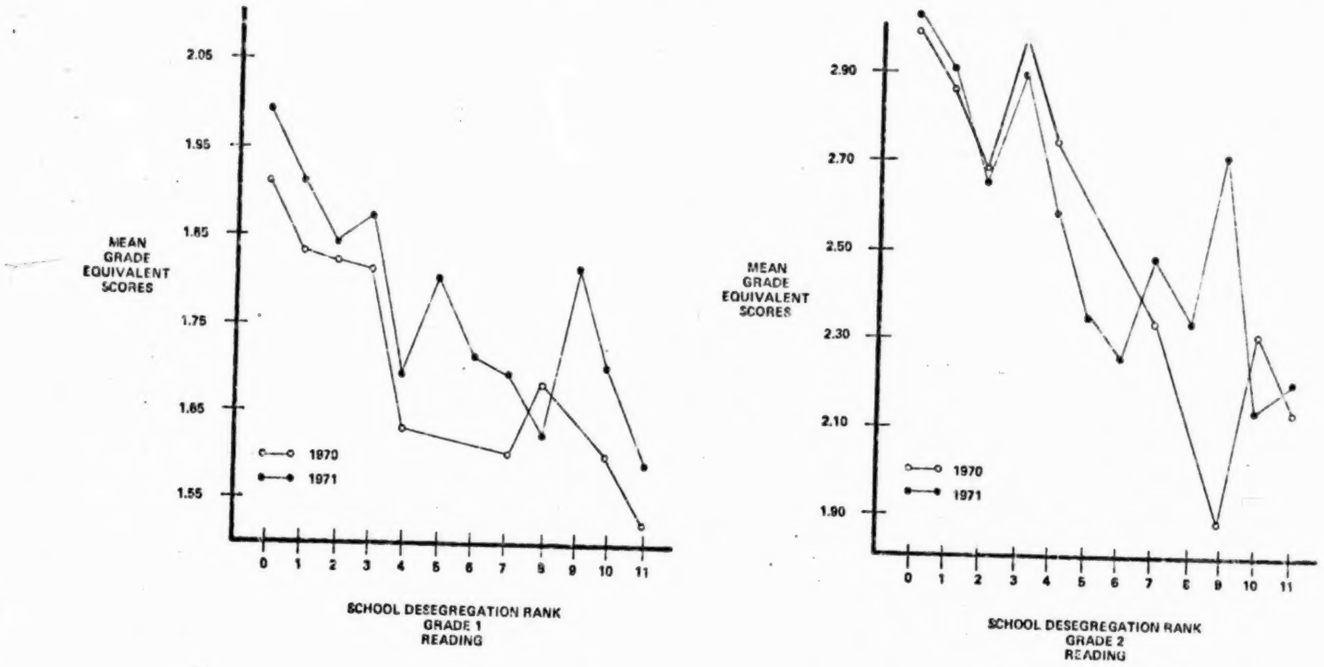
The ranks extend from 0 to 11 indicating respectively almost no to virtually all Black pupils. Ranks 1 through 10 cover successive 10 percent increments in percentage of Black students in the schools. On the average, Rank 0 will be 0 percent Black; Rank 1, 5 percent Black; Rank 2, 15 percent Black; Rank 3, 25 percent Black; etc.

It should be noted that the intervals on the vertical grade equivalent axis change from grade to grade, but are equally spaced within each grade. Note also that because the percent Black in many schools was appreciably modified from 1970 to 1971, the schools within one particular DR are not necessarily the same for the two years.

The purpose of the graphs is to provide a visual summation of the extent to which schools' standardized test performance means depend on percent Black in the schools. In inspecting the graphs, several characteristics will be noted. First, the general slope of the lines is consistently downward for both types of achievement, at each grade level for both 1970 and 1971. On the average, then, mean school achievement declines as a function of increasing desegregation rank, and this function, most frequently, is linear (Figures 6-11).

Equally important is the extent to which the points lie off this negatively accelerated function, for this indicates the extent to which one or more schools achieved differently than would be expected on the basis of percent Black alone. In several cases the extent to which a point is "out-of-function" is large.

1970 AND 1971 READING ACHIEVEMENT FOR SCHOOLS BY DESEGREGATION RANK



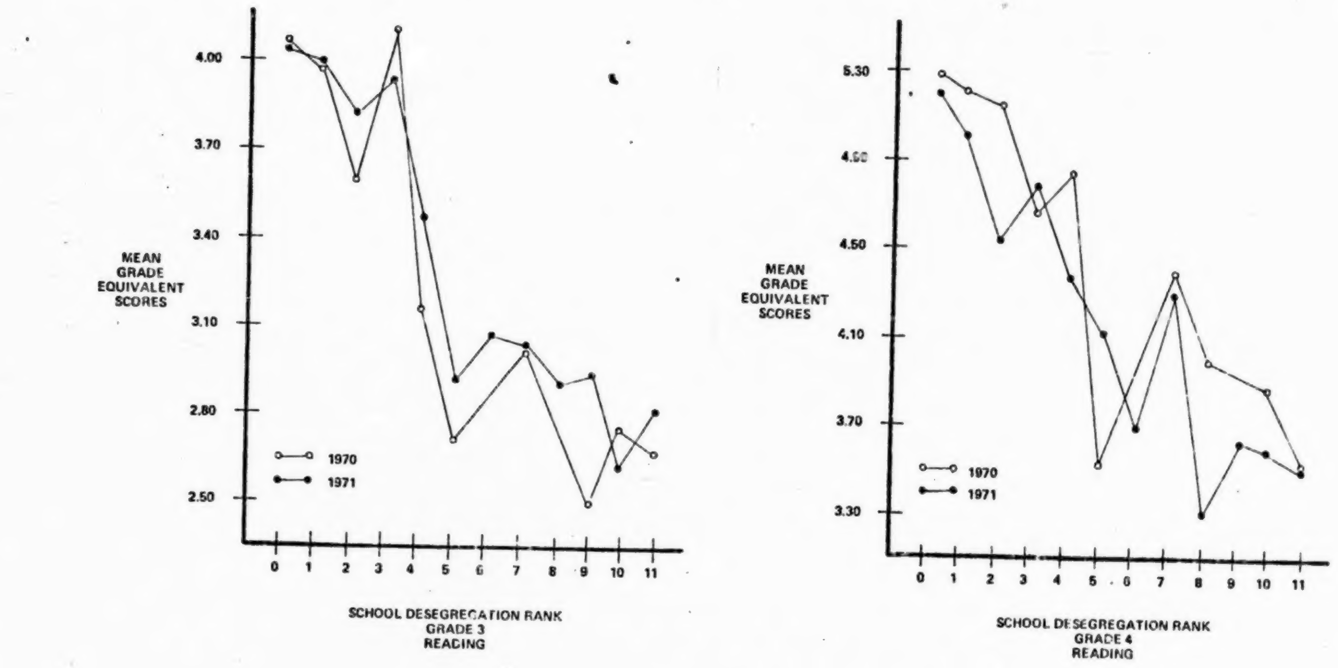


FIGURE 6

1970 AND 1971 READING ACHIEVEMENT FOR SCHOOLS BY DESEGREGATION RANK

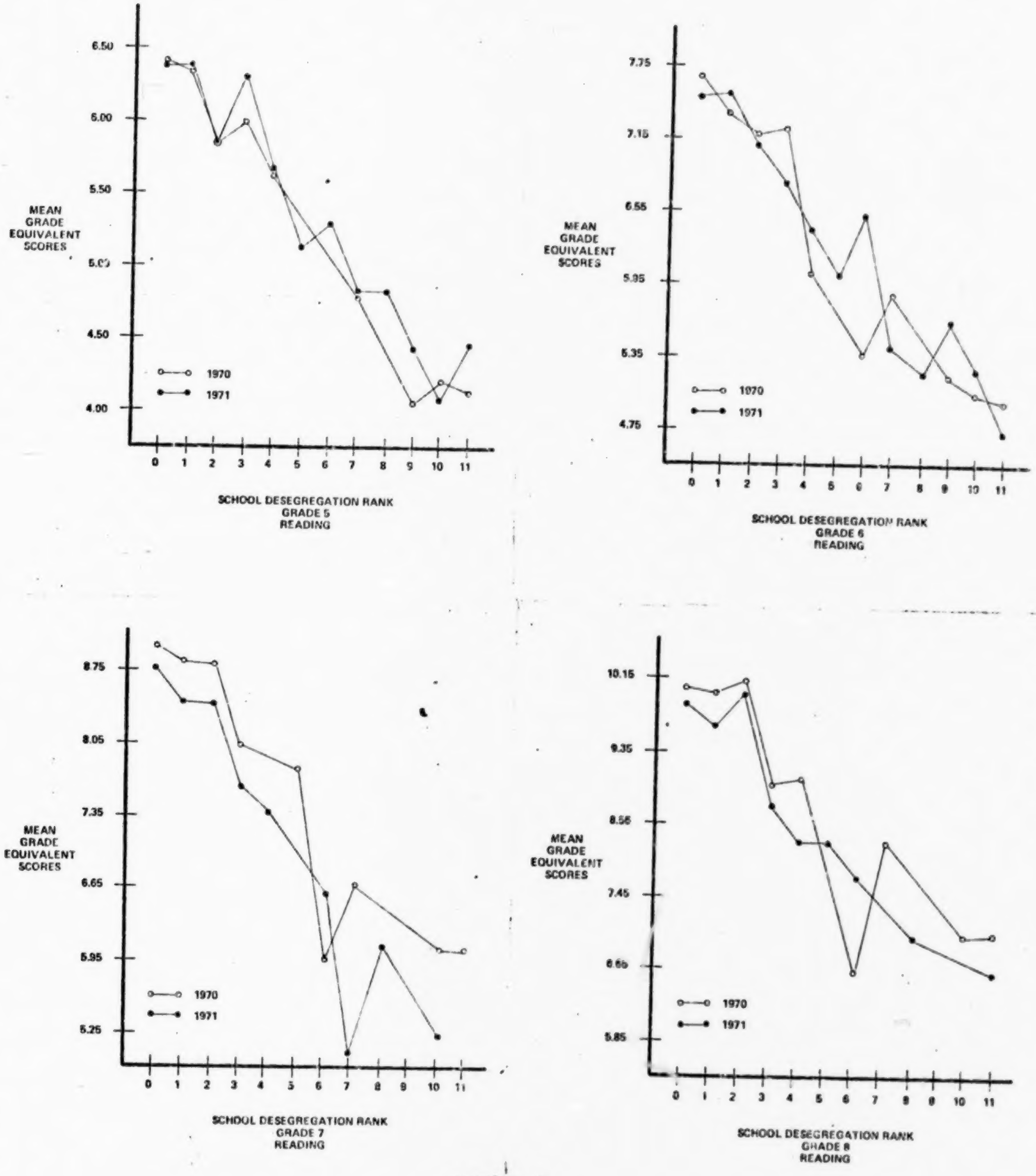


FIGURE 7

1970 AND 1971 READING ACHIEVEMENT FOR SCHOOLS BY DESEGREGATION RANK

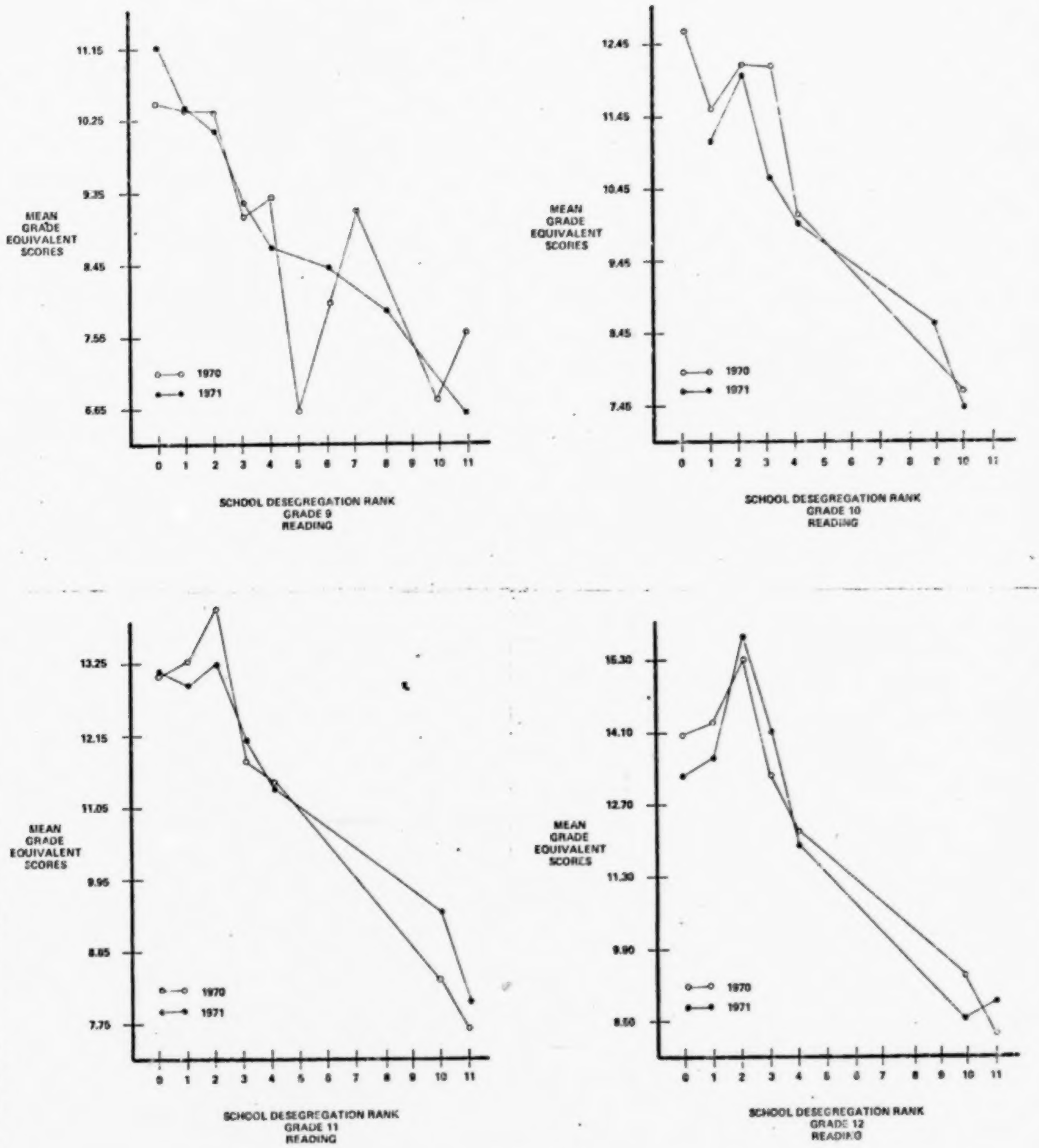
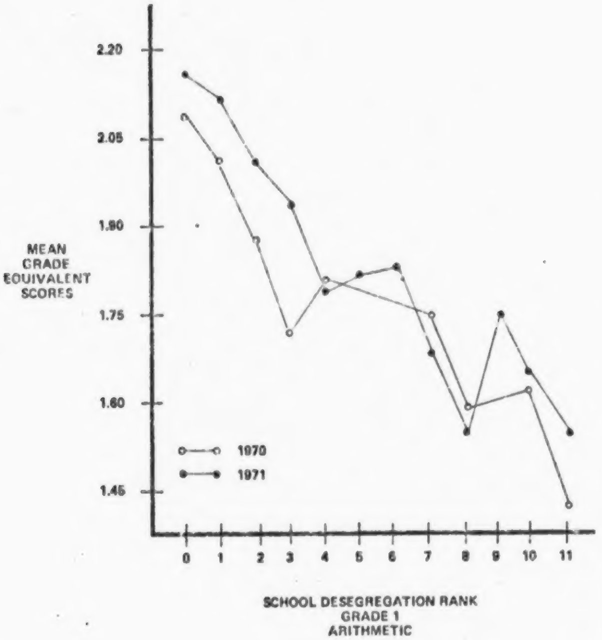
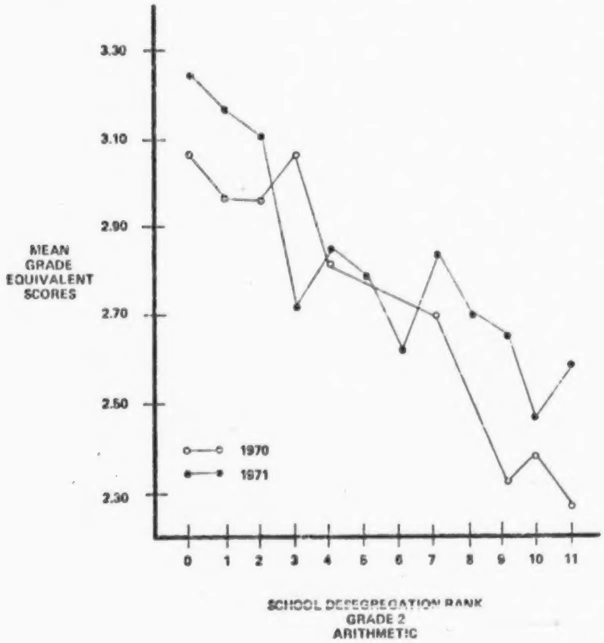
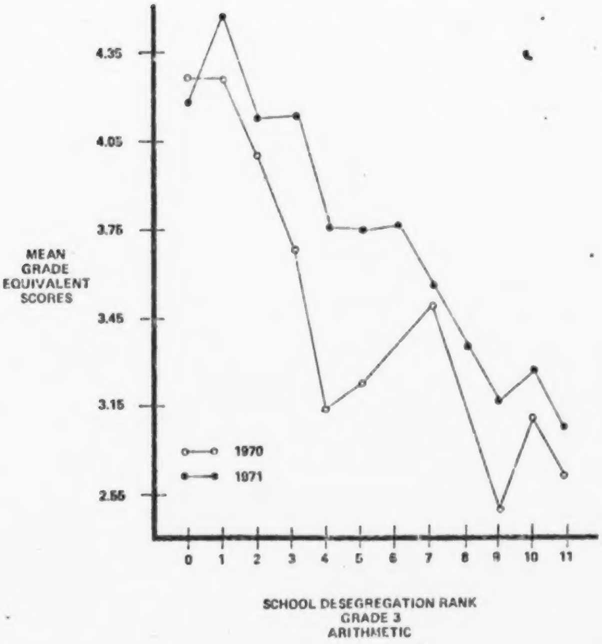


FIGURE 8

1970 AND 1971 ARITHMETIC ACHIEVEMENT FOR SCHOOLS BY DESEGREGATION RANK







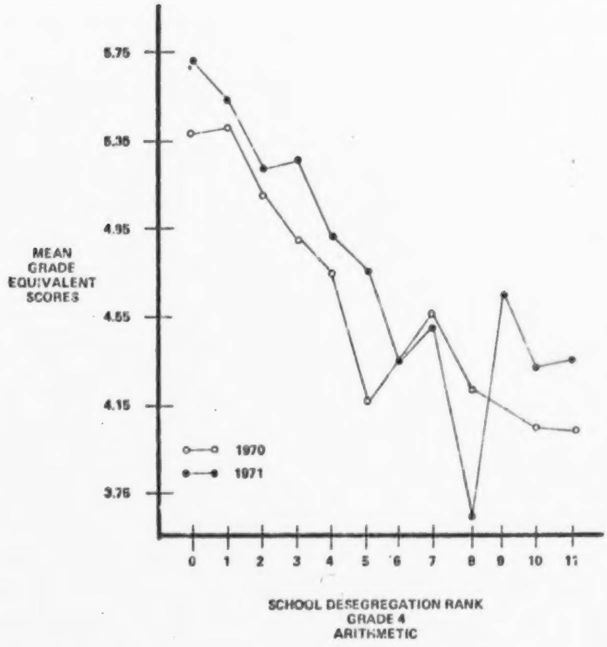


FIGURE 9

1970 AND 1971 ARITHMETIC ACHIEVEMENT FOR SCHOOLS BY DESEGREGATION RANK

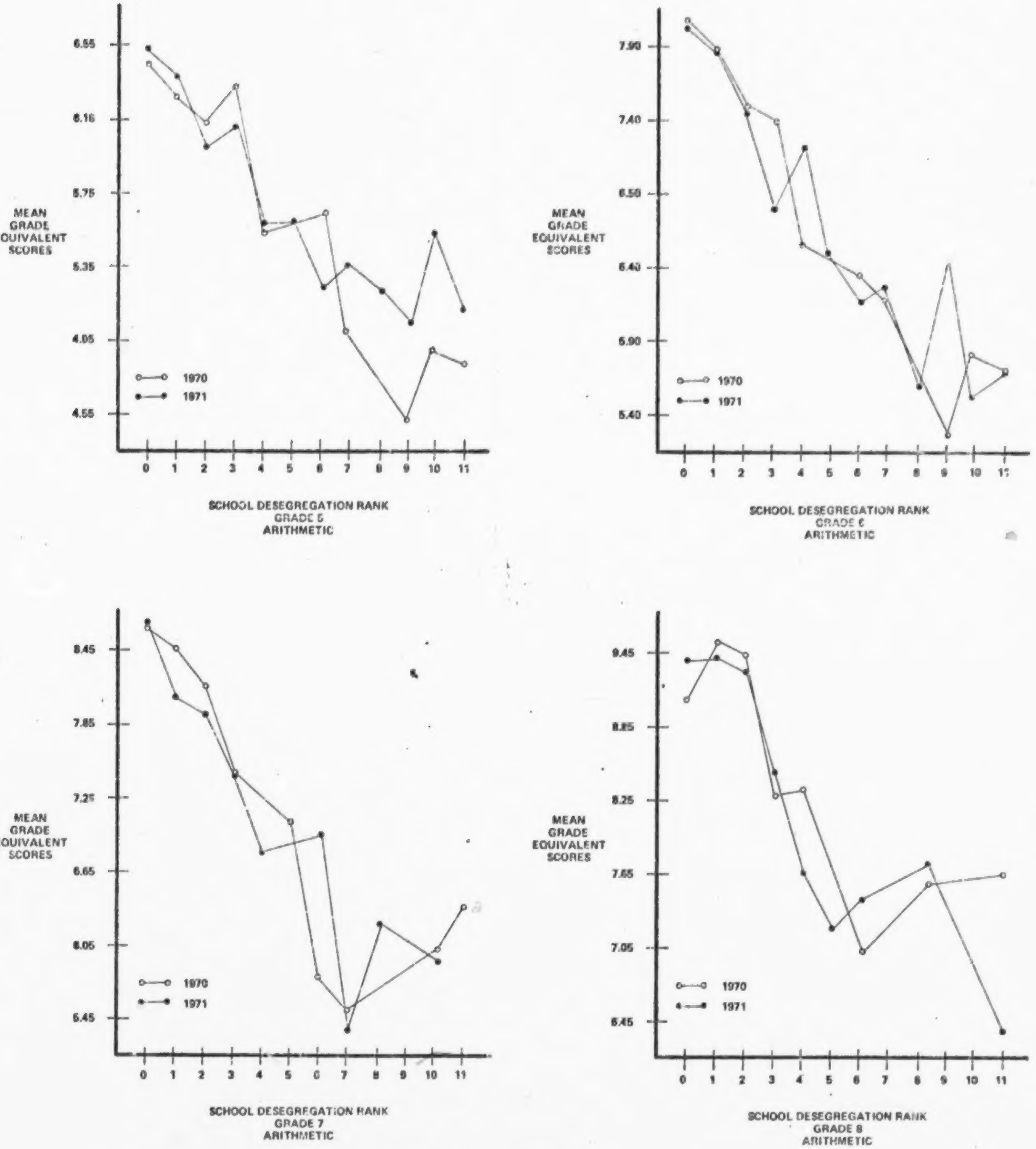


FIGURE 10

1970 AND 1971 ARITHMETIC ACHIEVEMENT FOR SCHOOLS BY DESEGREGATION RANK

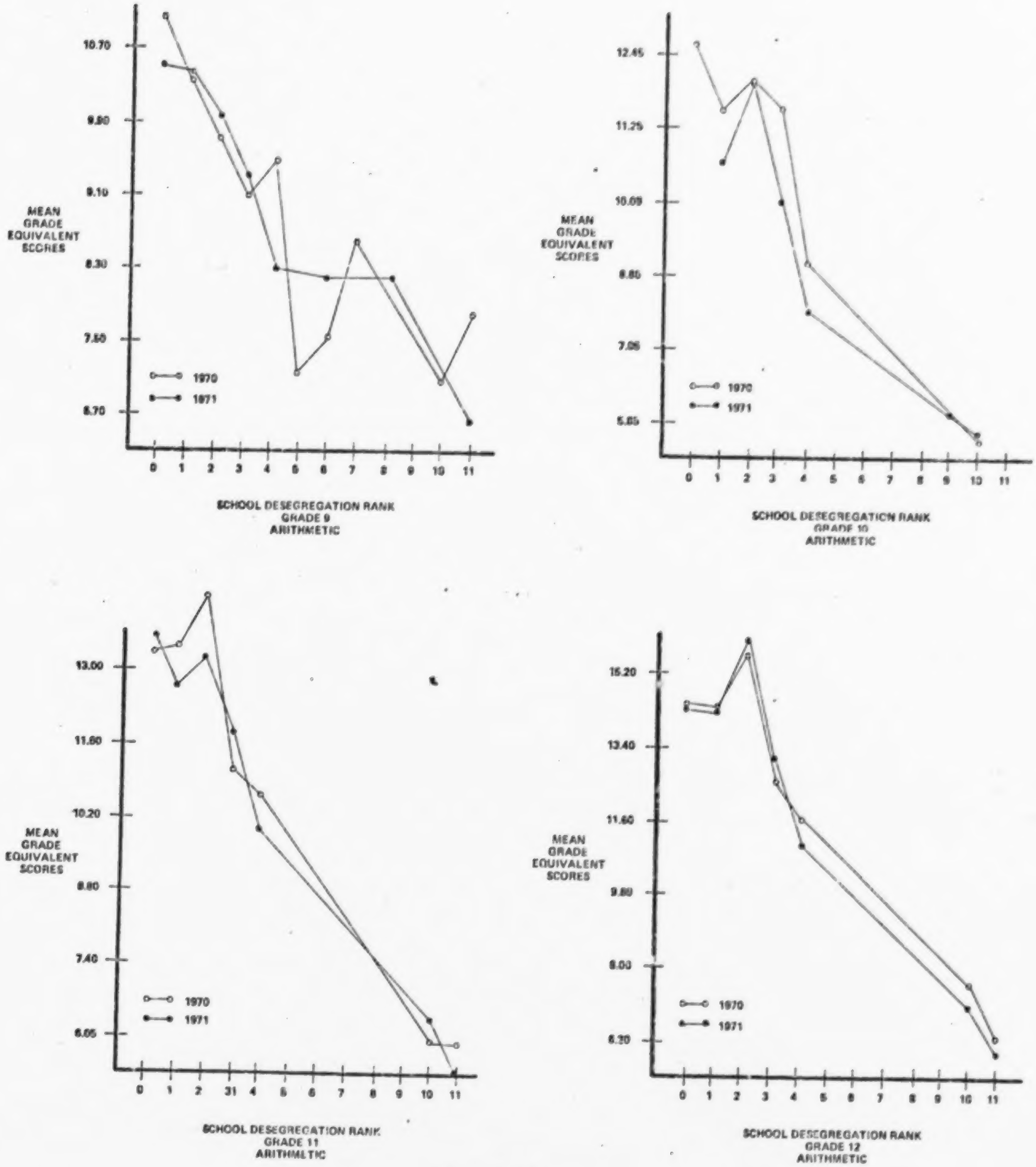


FIGURE 11

Actual Minus Predicted Achievement for Three Ethnic and the Total Groups by Desegregation Rank

Reading, and then mathematics achievement for grades 2, 4, 6, and 8 is plotted against desegregation rank. Achievement is presented by grade in A-P form. Hence, the graphs reflect the extent to which there is an association between the DR of the pupil's school and the extent to which he maintained his previous rate of achievement (Figures 12 and 13).

In each graph, achievement is represented for four groups of pupils: Black, SLO, Other and Total--Total representing all pupils in the county. Thus, the graphs also reflect the extent to which school DR is differentially associated with the achievement of various ethnic groups. A-P achievement is presented for reading at grades 2, 4, 6, and 8 and then for mathematics at the same grades.

Note should be taken of the fact that at the low DR's there are few Black pupils and at the high DR's there are few SLO and Other pupils. Means with few pupils are apt to be less stable than those computed on large numbers of pupils.

In grade 2, there are about 15 Black pupils across all the 0 percent Black schools. Similarly, there are very few, if any, SLO and Other pupils in the 95 percent Black schools. This ethnic membership pattern holds for the other grades as well.

Reading

For grades 2, 4, and 6, the total group's performance tends to be above predicted. At grade 8, the total group's performance tends to be lower than predicted. For grade 2, Black students at less than 75 percent Black schools tend to perform at lower than predicted levels. At the higher percent Black schools, they tend to perform slightly better than predicted. At grade 2, SLO and Other pupils average above predicted more or less irrespective of school DR.

At grade 4, the A-P means tend to increase in higher percent Black schools for all ethnic groups. At grade 6, A-P reading achievement appears to be very slightly and positively related to percent Black for all ethnic groups, at least in the middle range.

1971 ACTUAL MINUS PREDICTED ACHIEVEMENT BY 1971 DESEGREGATION RANK FOR THREE ETHNIC AND TOTAL GROUPS

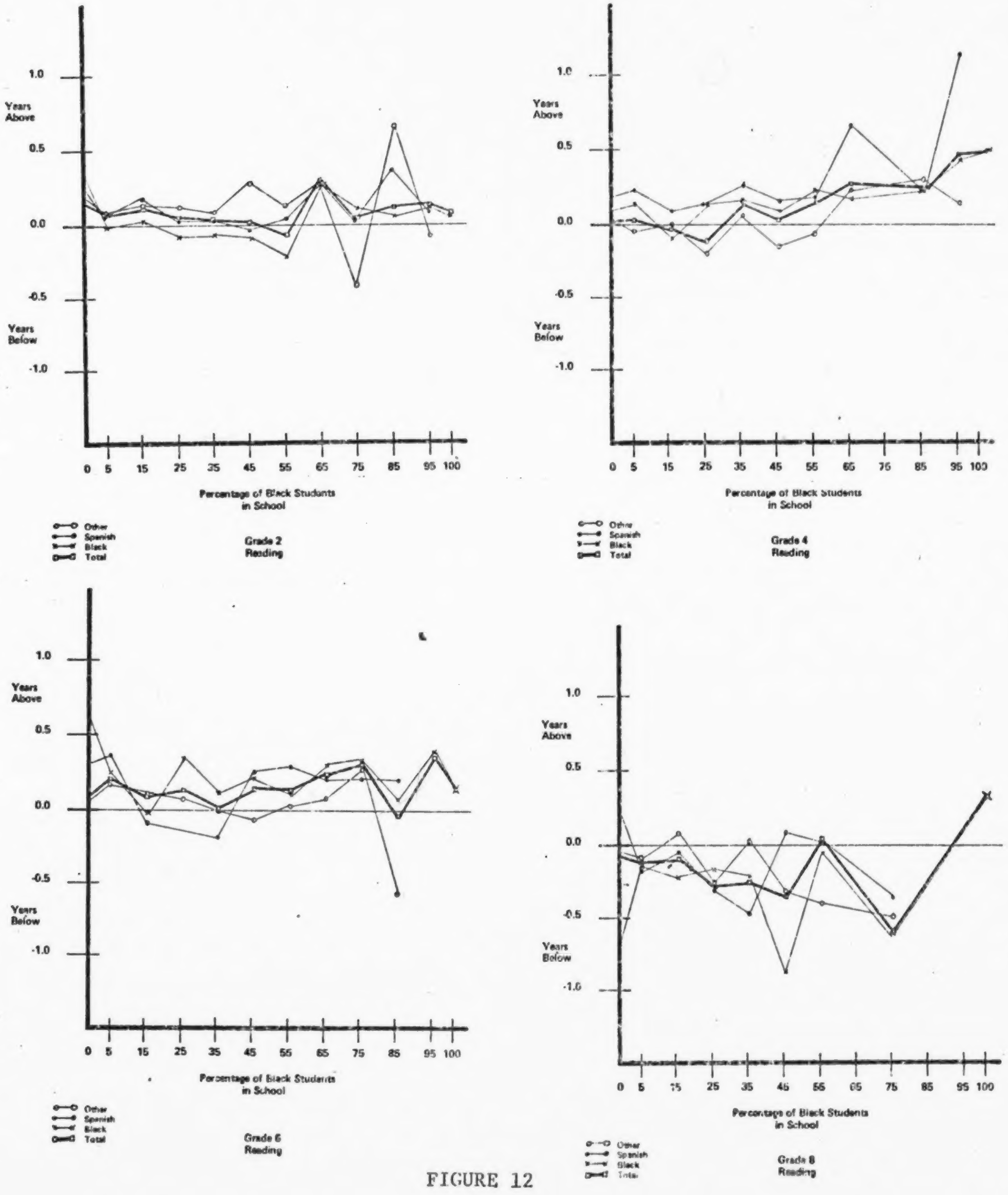
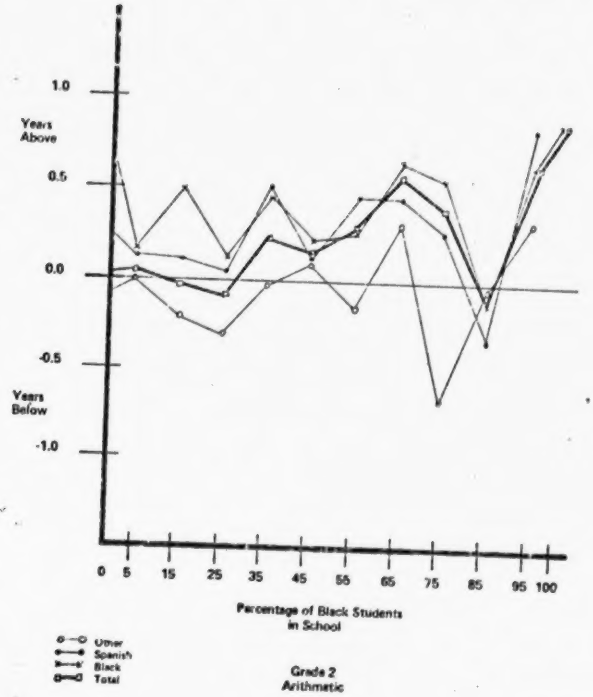
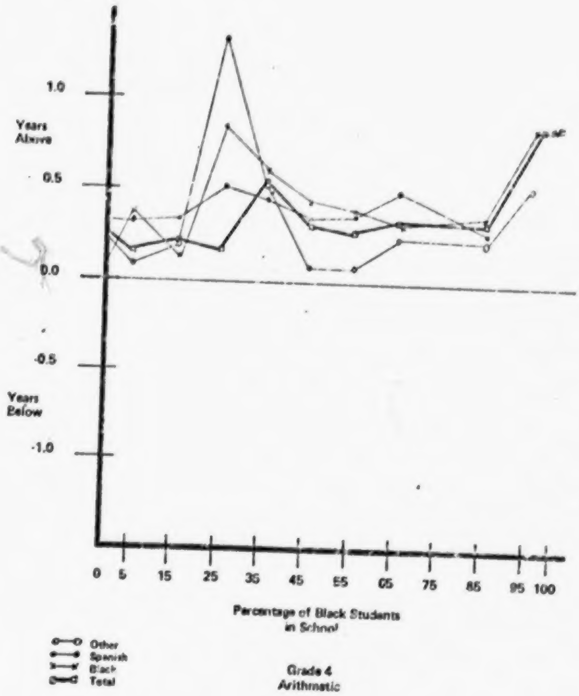


FIGURE 12

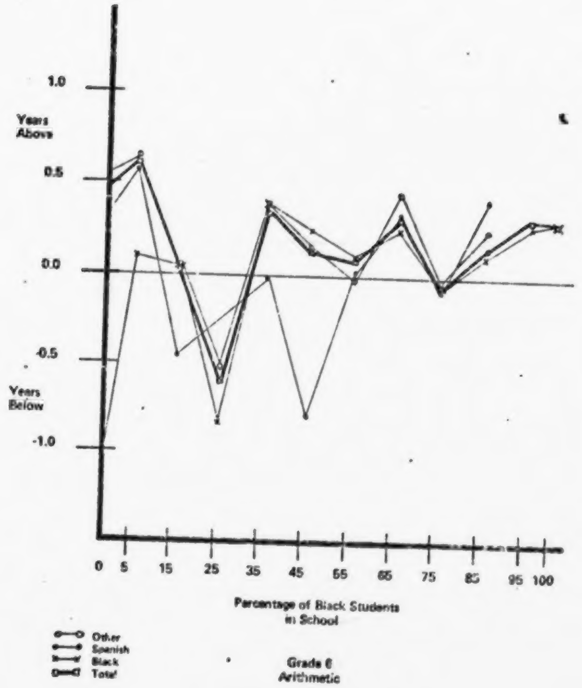
1971 ACTUAL MINUS PREDICTED ACHIEVEMENT BY 1971 DESEGREGATION RANK FOR THREE ETHNIC AND TOTAL GROUPS



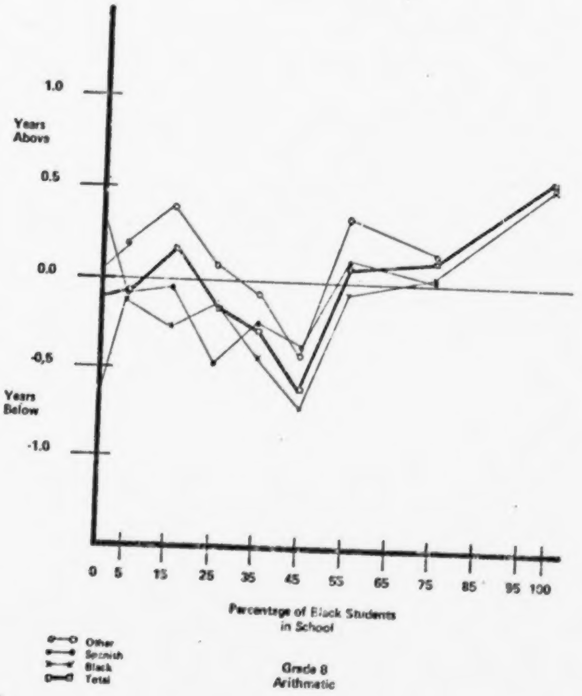
Grade 2
Arithmetic



Grade 4
Arithmetic



Grade 6
Arithmetic



Grade 8
Arithmetic

FIGURE 13

At grade 8, the data signal to noise ratio is greater than in the elementary grades. The majority of all ethnic group means falls below predicted. For all ethnic groups, performance generally declines slightly with increasing percent Black. Black A-P achievement, however, increased markedly in the all Black schools.

For grades 2, 6, and 8, the middle percent Black schools appear to achieve less well than those at the extremes of the percent Black range. The same trend is present at grade 4, but only for the 10 to 40 percent Black schools.

Arithmetic

For grades 2 and 4, total group achievement increases with percent Black. In grade 6, achievement increases slightly after a substantial drop in the 25 percent Black schools. At grade 8, the average achievement of all pupils is consistently related to percent Black. Black pupils, in particular, tend to have high A-P mathematics achievement in predominately or all Black schools at each of the four grades. Beyond these few statements, the signal to noise ratio in A-P arithmetic achievement precludes generalizations. And even these few are open to question. There are marked drops and increases at several points on each graph for each of the ethnic groups. But on the average, these large changes follow no meaningful pattern across either ethnic groups or grades.

Overall on the set of eight reading and arithmetic graphs, there is little to suggest that percent Black in school is negatively related to actual minus predicted achievement in a consistent manner. At grade 4 on reading and mathematics, and on grade 2 arithmetic, A-P achievement across ethnic groups appears to relate moderately and positively to percent Black in school. Also, notable is the fact that in all graphs Black A-P achievement is consistently high in schools of nearly or virtually all Black students.

Several cautions warrant mention. The reader should remember that the graphs reflect 1971 actual performance as it differs from the projections made from 1970 performance. In no way do the graphs reflect actual, unadjusted levels of 1971 achievement. Also, if percent Black relates to A-P achievement, it must be in a consistent, but not necessarily linear manner. The rapid changes from one to another adjacent percent Black categories are noise produced by other unknown factors. These rapid changes should not be attributed to percent Black changes.

1970 Achievement Quarters and 1971 Ethnic A-P Achievement by Percent Black

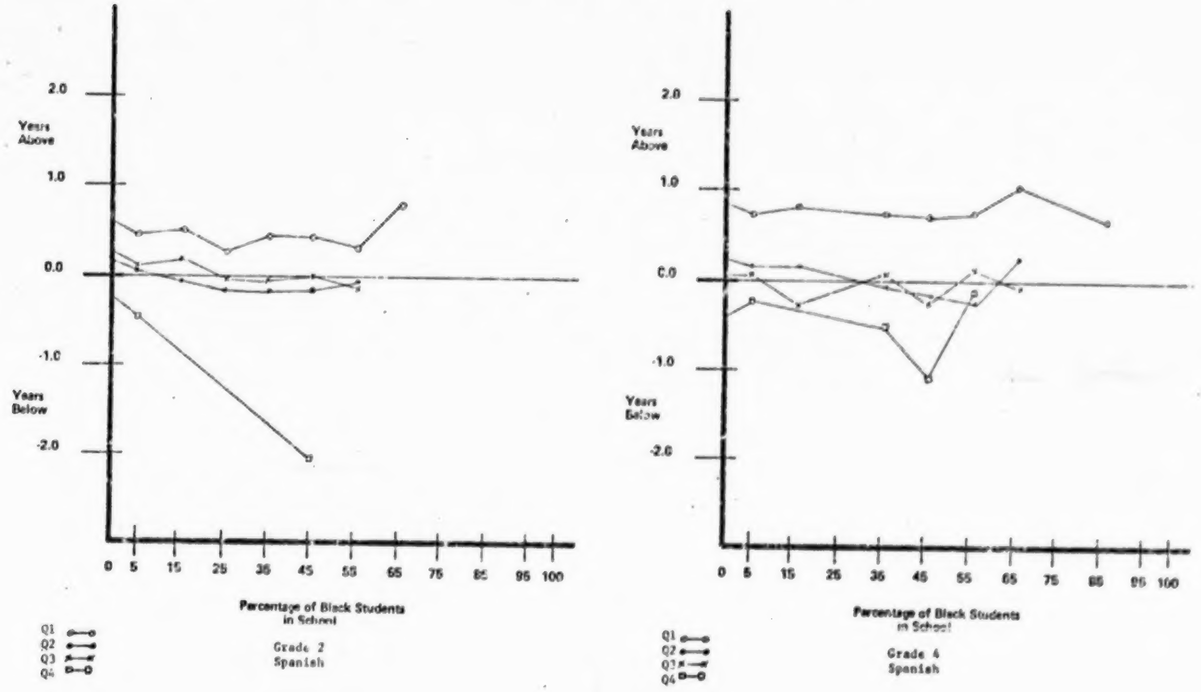
In this section we investigate the possibility that 1971 percent Black is differentially related to 1971 achievement according to the pupils' 1970 achievement levels. The question asked is, "is the 1971 A-P achievement of those students who scored at one level in 1970 associated differently with 1971 percent Black than the achievement of those pupils who scored at a higher (or lower) level in 1970?" Technically, this is a question of interaction between 1970 achievement and 1971 percent Black upon 1971 achievement. The data are given in Figures 14-16.

A-P 1971 reading achievement is presented for three ethnic groups by percent Black in school for grades 2, 4, 6, and 8. In each graph four groups of pupils are defined, based on their 1970 reading achievement. The Q1 group represents all the members of that ethnic group who were among the lowest 25 percent of achievers in 1970. Q2 represents those scoring in the second lowest 25 percent of students in 1970. Q4 represents the highest score in the 1970 group,. and Q3 the second highest scoring group. Separate quarters were defined at each grade, and are applied across all pupils, not for each ethnic group separately.

Inspection of the graphs indicates that all Q4 group averages consistently fall below predicted, and that nearly all Q1 groups scored above prediction. This occurrence is to be expected on the basis of both attribute stability and measurement error, and will accrue for any test instrument that does yield perfectly correlated results over time.

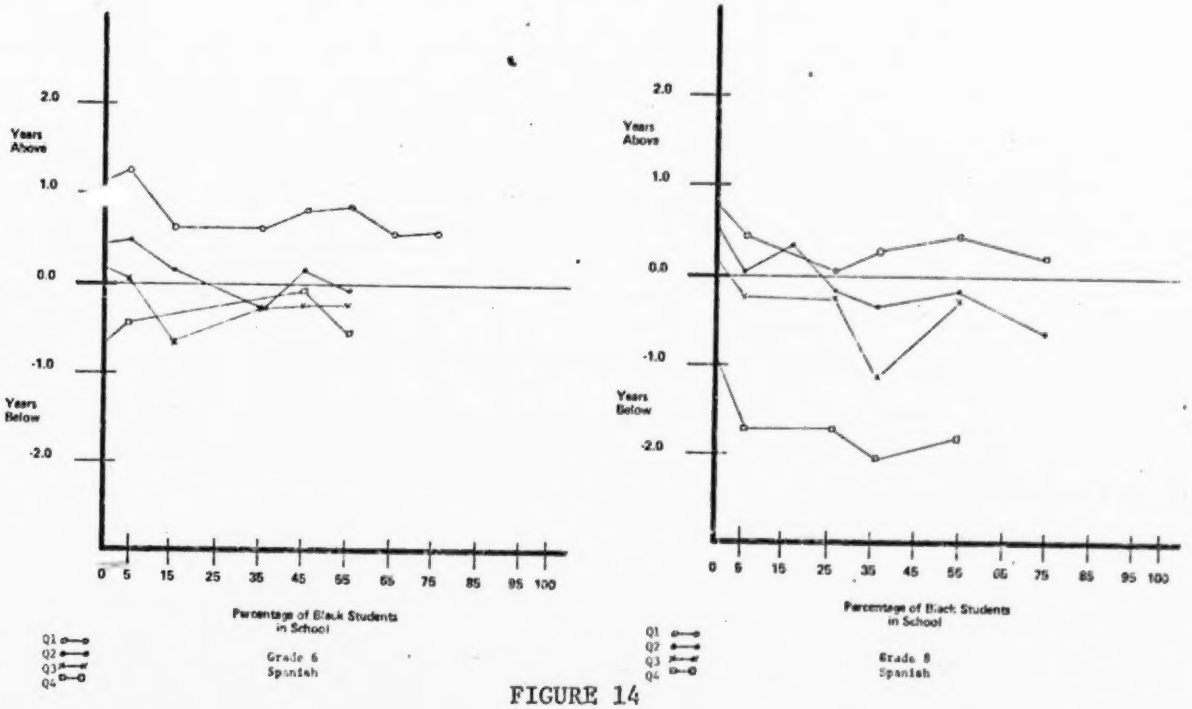
The point of interest is whether or not the lines have similar or different patterns across ethnic groups and grades. Arithmetic achievement is not presented because of its high noise content as indicated in the previous section.

1971 ACTUAL MINUS PREDICTED READING ACHIEVEMENT BY 1971 DESEGREGATION RANK BY 1970 ACHIEVEMENT QUARTER



Grade 2
Spanish

Grade 4
Spanish



Grade 6
Spanish

Grade 8
Spanish

FIGURE 14

1971 ACTUAL MINUS PREDICTED READING ACHIEVEMENT BY 1971 DESEGREGATION RANK BY 1970 ACHIEVEMENT QUARTER

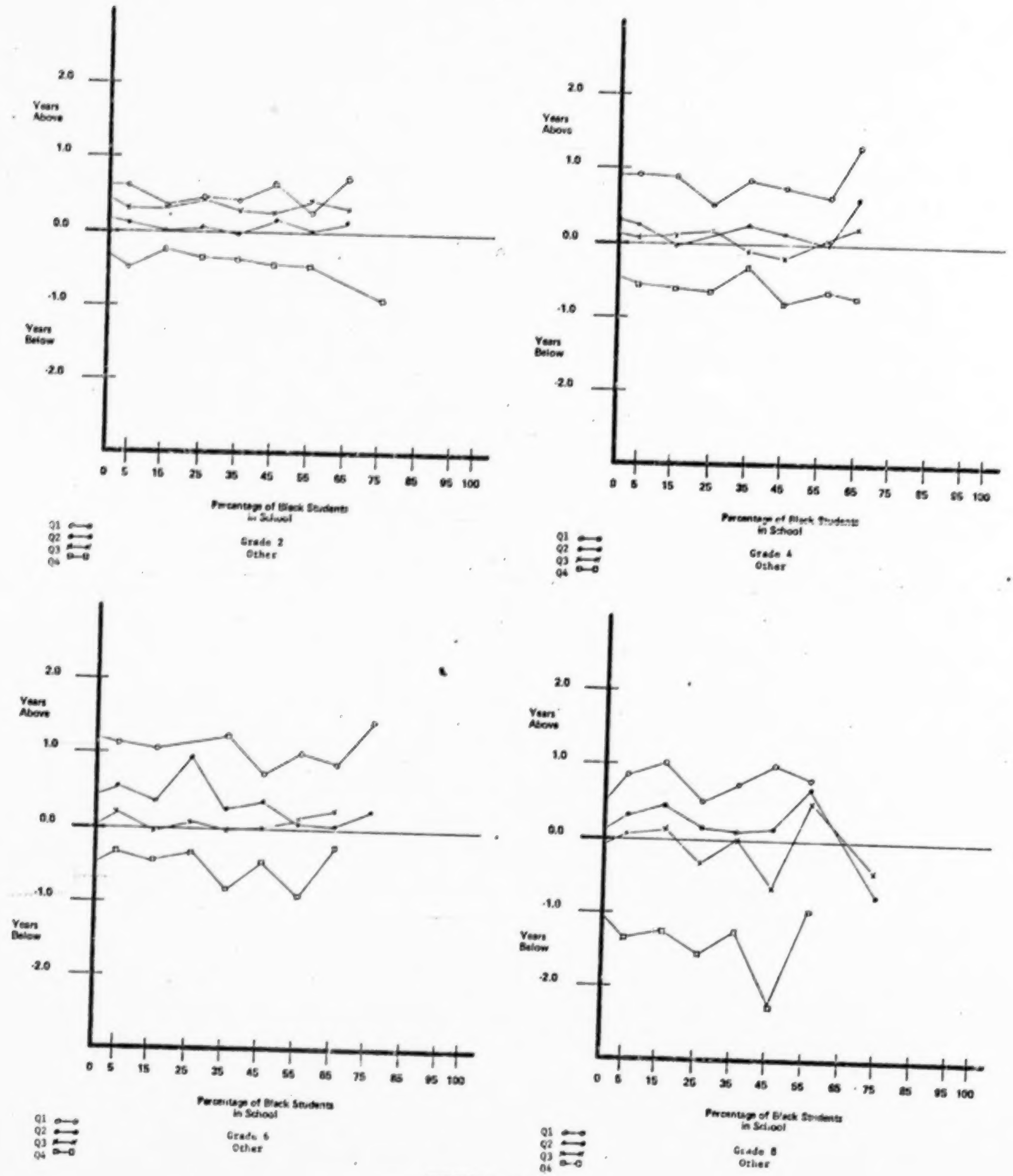


FIGURE 15

1971 ACTUAL MINUS PREDICTED READING ACHIEVEMENT BY 1971 DESEGREGATION RANK BY 1970 ACHIEVEMENT QUARTER

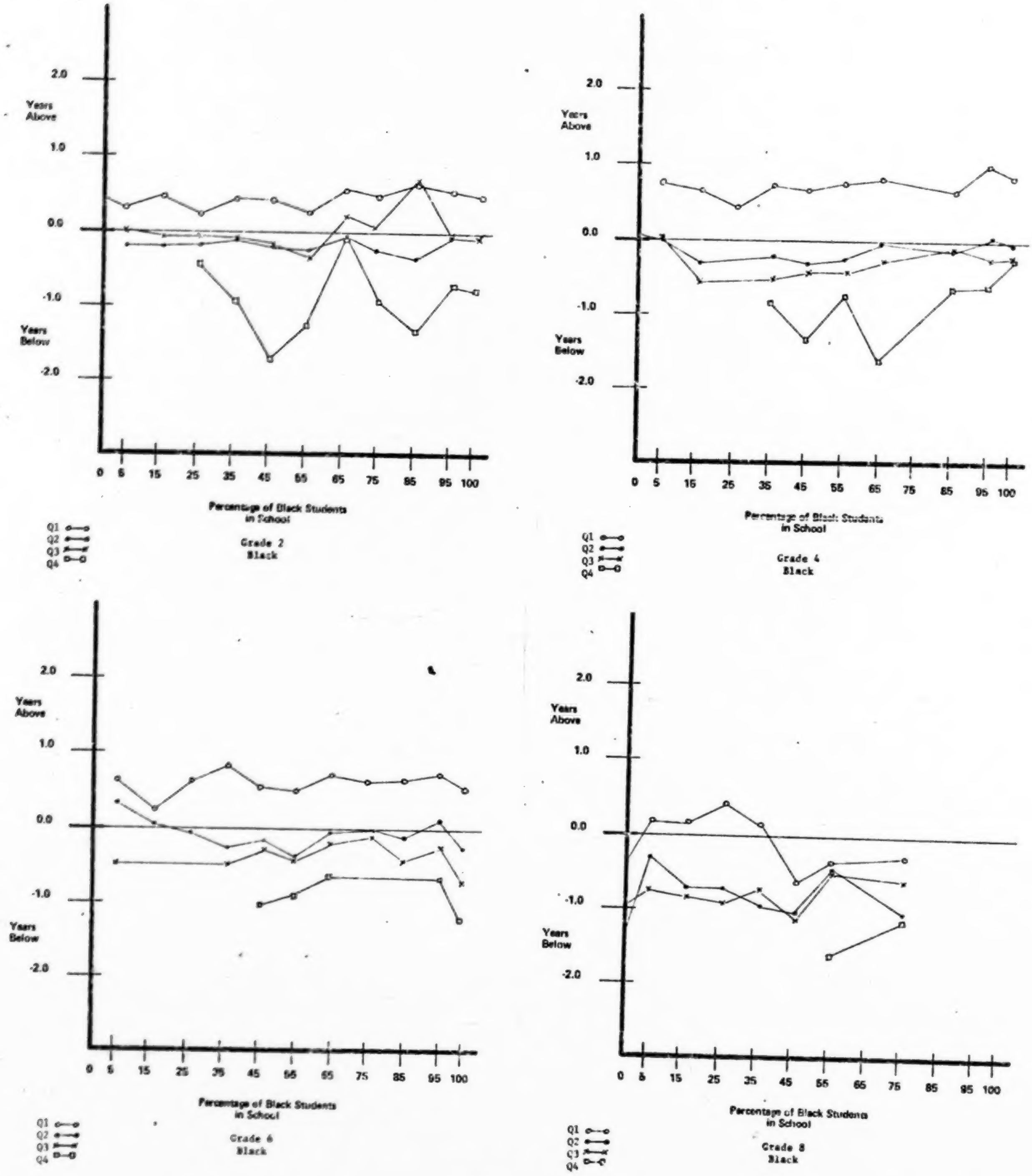


FIGURE.16

GRADES 2, 4, and 6

At grades 2 and 4, and for all ethnic groups, the Q1 achievement appears unrelated to percent Black. The only possible exception to this is SLO pupils attending 0 to 9 percent Black schools, where those Q1 pupils score about .4 grade equivalent units higher than other pupils in higher percent Black schools. As this occurrence is not repeated at other grades, it is quite possibly noise created by factors other than percent Black.

For Others, Q4 achievement tends to decrease slightly as a function of increased percent Black. At each of the three grades--and at grade 8 as well--Q4 Black achievement appears to increase slightly with percent Black, but the noise, due to small numbers of pupils, is such as to make this generalization very tentative.

Black students' A-P achievement for the two middle groups, Q2 and Q3, appears unrelated to percent Black except possibly in grades 4 and 6 where achievement in the intermediate percent Black schools is slightly lower than at the extremes. For Other, achievement in the Q2 and Q3 groups is unrelated to percent Black. SLO Q2 and Q3 pupils decline slightly with increases in percent Black.

GRADE 8

For all ethnic groups and all Q groups, A-P achievement is either unrelated or slightly negatively related to percent Black. Excepting the Q4 Black group, the most typical pattern is a slight score decrement with increased percent Black.

Across all grades, several ethnic and Q groups evidence differential associations between percent Black and A-P reading achievement. Only at grade 8 is there a consistent relationship across all groups between A-P achievement and school percent Black, and this relationship is moderate but negative. For Others, achievement across grades and Q groups tends to decline slightly or to be unrelated to percent Black. For Blacks, and excepting grade 8, achievement across grades and Q groups either increases slightly with or is independent of percent Black. For SLO pupils, across Q groups, A-P achievement tends to decline slightly with increases in percent Black.

As in the previous section the reader should note that inference about actual, as opposed to A-P, achievement cannot be made from the current set of graphs. Also note that effects of the 1970 to 1971 shift in percent Black has not been evaluated in this section.

1970 TO 1971 DESEGREGATION AND ACHIEVEMENT

General Considerations

In this final part of the achievement analysis, the relationships between the 1969-70 and 1970-71 desegregation ranks and pupils' reading and mathematics achievement are investigated. The ranks for the two years are crossed to form a matrix similar to the example below. Whereas the example ranks extend from 0 to 4, the actual data ranks extend from 0 to 11.

1971
DR

		0	1	2	3	4
	0	0,0	0,1	0,2	0,3	0,4
	1	1,0	1,1	1,2	1,3	1,4
1970 DR	2	2,0	2,1	2,2	2,3	2,4
	3	3,0	3,1	3,2	3,3	3,4
	4	4,0	4,1	4,2	4,3	4,4

Let i = row numbers from 0, 1, 2, ..., 4
Let j = column numbers from 0, 1, 2, ..., 4

The rows of the matrix indicate the desegregation rank of the 1969-70 school; the columns indicating that of the 1970-71 school. Note that the paired subscripts i, j denote cell locations and hence, cell desegregation ranks. Cells where the value of i and j are identical, i.e., 0, 0; 1, 1; 9, 9; etc., are termed principal diagonal cells, and in these cells are those pupils who attended schools of the same, or very nearly the same, percent Black in 1969-70 and 1970-71. For any row, the off-diagonal cells denote a change in the pupils' desegregation rank from 1969-70 to 1970-71--hereafter, 1970 and 1971 will be used to reference the respective school years. Row cells to the left of the principal diagonal indicate a decrease in the percent Black of the pupils' school-grade-cohorts from 1970 to 1971. Row cells to the right of the principal diagonal indicate an increase in desegregation rank from 1970 to 1971. The further any particular row cell is from the corresponding diagonal cell, the greater the 1970 to 1971 change in the percent pupil's school-grade-cohort that is (was) Black. The desegregation ranks of the cells for all 1970 x 1971 matrices denote percent Black in grade rather than in school. However, the desegregation ranks for grade and for school are generally the same.

Interpretation of the cell locations is straight forward. For example, pupils included in cell 0,0--the upper-left most--had school-grade-cohorts of less than one-tenth of 1 percent Black in 1970 and 1971. Pupils included in cell 0,4 had school-grade-cohorts of less than one-tenth of 1 percent Black for 1970 and between 30 and 40 percent for 1971. Hence, on the average, pupils in cell 0,4 had an increase in Black percent-grade-cohort of about 35 percent. Similar procedures may be used to determine the change in desegregation level for pupils in any cell.

The focal point for desegregation matrix analyses is to determine whether or not there are patterned relationships between cell locations and achievement. Two types of achievement are used; reading and mathematics. Within cell means and standard deviations (and pupil frequency counts) are computed for three types of scores on both reading and mathematics.

For each ethnic group, each grade, and each type of achievement, a separate matrix is used for each score type. The first type of score is the 1970 achievement. The 1970 scores were secured before implementation of the pupil desegregation court orders. Because of their "before-the-fact" nature, these scores establish a basis of comparison. In particular, we shall be interested in whether or not "after-the-fact" scores evidence different patterns than the 1970 scores.

The second score type is a pre- to post-difference score. These difference scores (post-pre) reflect the per pupil gain (or loss) in achievement from May of 1970 to May of 1971. For these scores, the points of interest are whether or not the magnitude of the gain is related to cell location in a manner similar to the 1970 scores.[1]

The third score type is the actual-minus-predicted score (A-P). The method of computing the A-P scores was described in the Appendix. In effect, the A-P is the difference between the pupil's actual 1971 test performance and the 1971 projected performance. The projection is based on the ratio of the pupil's 1970 grade-equivalent score to his 1970 grade level.

Means and standard deviations on each of the three score types are reported on reading (Paragraph Meaning--PM) and mathematics (Arithmetic Computation--AC) achievement for each ethnic group at grades 2, 4, 6, and 8. The number of grades on which achievement is presented in the report was reduced because of space, time, and cost limitations. Achievement at all grade levels was analyzed. High school achievement is not reported because the court orders applied only to junior high and elementary schools, resulting in little or no change in the desegregation ranks of the higher grades.

Seventy-two desegregation-rank achievement matrices are reported across the three score types for the two types of achievement for each of three ethnic groups at four grades: 3 x 2 x 3 x 4 = 72.[2] The matrices are presented in the following order: achievement type > grade > ethnic group > score type. All reading achievement is presented first, grades in sequence. Within each grade the ethnic order is Black, Other, SLO.

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[1] The post minus pre scores will not be used for any statistical analyses. They are included only for the reader's inspection.

[2] Because of their technical complexity and volume, they are presented in a separate volume, Technical Supplement. For illustration purposes, the 12 matrices for grade 2 are presented in the Appendix of this volume.

Within each ethnic group the score-type order is 1970 scores, post minus pre, and finally the actually minus predicted (A-P) scores. The same sequence is then repeated for arithmetic achievement.

In each cell the mean is the top most number, followed by the standard deviation. The cell frequency count is the bottom most number and indicates the number of pupils over which the cell mean and standard deviation are computed. The mean is simply the arithmetic average. The standard deviation is a measure of the spread of scores about the mean. Typically, about two-thirds of the scores will fall in the interval equal to the mean plus and minus one standard deviation.

Inspection of the cells in the various matrices indicates that the majority of cells contain very few or no pupils. For the elementary grades, the vast majority of Other and SLO pupils are concentrated in the upper-left quadrant cells. Black pupils tend to fall predominately in the lower-right quadrant cells. At the junior high grades, grade eight in the reported data, the ethnic frequencies are more widely dispersed, but the quadrant concentrations noted above are still evident.

Our original intent had been to investigate relatively complex patterns between cell location (1970 and 1971 DR) and achievement. We found, however, that because most cells were either empty or nearly so, only very rudimentary questions could be asked of the data. In particular, pupil densities were such that we had to restrict the analyses to two rows in each matrix.

If the matrix represents achievement of SLO or Other pupils, the analysis is restricted to the two top rows. These rows respectively contain the ethnic members who attended schools of less than 1 percent Black or between 1 and 9 percent Black in 1970, and who in '71 were attending schools of from 0 to occasionally 80 percent Black.

For matrices representing the achievement of Black pupils, we used only the two bottom rows, which contained the majority of Black pupils. These rows respectively contain pupils who in 1969-79 were attending school of 90 to 99 percent Black pupils and 100 percent Black pupils, and who in 1970-71 were attending schools of from 100 percent to occasionally between 20 and 30 percent Black.

In all analyses we ignored any cell containing fewer than 20 pupils.

From inspection of the matrices, we note that for all ethnic groups the higher 1970 scores tend to appear in the upper left quadrant. There are, of course, many exceptions to this statement. This occurrence, we believe, is due to social and economic (SES) considerations, and indicates that higher SES pupils in both years tended to attend schools with low percent Black. However, in the absence of pupil SES data we cannot confirm this hypothesis.

Also by inspection, we note that there is considerable noise in the data. Cell to cell differences in means are occasionally very large, even when the cells contain 100 or more pupils, and when the cells are very similar with respect to 1970 and 1971 DR.

For the previously specified rows of the matrices, correlations were computed for the 1970 and 1971 cell means on reading and arithmetic. The SLO and Other correlations across the four grades (2, 4, 6, and 8) were reasonably high, averaging about .80 for reading and slightly lower for arithmetic.

For Black pupils, achievement over the two years was somewhat less stable, the correlations ranging from +.08 to +.96, and averaging about +.45. Though these correlations differed substantially, they followed no pattern by grade or 1970 DR. Hence, while the 1970 to 1971 correlations for Black pupils are lower than we expected, we cannot isolate the sources of the disturbance.

Irrespective of other considerations, of interest is the relationship between pre-desegregation (1970) achievement and 1971 DR. Correlations between these two variables indicate whether or not (for any row of a matrix) there is a relationship between past achievement and extent of desegregation after implementation of the 1970 court orders. In particular we were interested in whether high scoring 1970 pupils were more or less likely to be involved in the increased school desegregation, than their low scoring ethnic cohorts.

For both Black and Other pupils, the correlations between 1971 DR and 1970 achievement ranged from moderately positive to moderately negative (-.64 to +.63 for Blacks, and -.59 to +.69 for Others), but across grades and 1970 DR's the average correlation for each of these ethnic groups was effectively zero. Hence, on the average there was no consistent relationship between past achievement and extent of 1971 desegregation for Other and Black pupils.

For SLO pupils there was a definite pattern between past achievement and extent of 1971 desegregation. Fifteen of the 16 correlations (two of each grade for each of reading and mathematics) were negative, averaging about -.55 across grades and 1970 DR's. Hence, for SLO pupils the extent of involvement in '71 ethnic desegregation was proportionately greater for low than for high achieving students. The causes for this are not in evidence but may have something to do with the geographical distribution of schools serving SLO students. There is also the possibility that higher SES Spanish parents moved their children to either other public or possibly private and parochial schools when the percent of Black pupils in school increased.

1971 Achievement and Implementation of the 1970 Pupil Desegregation Court Orders

As in the previous portion, we shall limit the analyses to the two rows of the 1970 by 1971 desegregation matrices containing the majority of the ethnic members. We shall continue to use the DR cell mean rather than the individual pupil as the unit of analysis,[1] and analyses will be conducted within rather than across the 1970 DR's.

In the prior analyses, it was noted that correlations between 1970 and 1971 achievement differed appreciably across ethnic groups, grades, and 1970 DR's, and that there were considerable cell to cell differences in both the 1970 and 1971 means. These two considerations indicate that for specific rows of the matrices one cannot assume that pupils in various 1971 DR cells were necessarily similar prior to the 1971 desegregation. Hence, some technique was needed to adjust for these differences prior to investigating relationships between 1971 DR and 1971 ethnic achievement. Two procedures were used to accomplish this end. In one case the A-P cell means were used, and regressed against 1971 percent Black. The A-P means have already been adjusted on the basis of the individual student's 1970 achievement. This procedure was described in the Appendix.

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[1] We are currently analyzing the data on a per pupil basis. While the size of the regression coefficients will differ somewhat for the two analytic units, the sign of the coefficients should generally remain unchanged. Hence, the conclusions for the two procedures will probably be similar.

The second procedure used was multiple regression, 1971 achievement regressed against the 1970 cell mean and the 1971 percent Black. By using both 1970 achievement and 1971 percent Black in the equation, the regression weights are computed so as to provide independent estimates of the effect of the two predictor (1970 achievement and 1971 percent Black) variables.

In each of the procedures the 1971 percent Black coefficient reflects the extent of association between percent Black and 1971 achievement, adjusted for 1970 achievement. As the two procedures do not use the same logical basis for the adjustment, their results are not necessarily equivalent. To the extent that the results are reasonably equivalent, the conclusions from the analyses are strengthened. For the multiple regression analyses the coefficient for 1970 achievement will not be reported because it is useful primarily as an adjustment component and because we have earlier discussed the correlations between achievement for the two years.

The 1971 percent Black regression coefficient under either procedure provides an estimate of the rate of change in 1971 cell mean achievement given one unit of change in percent Black. For instance, if the coefficient for second-grade Blacks in 1970 DR of 11 were .0030 it would indicate that on the average achievement increased by .003 grade-equivalent units for each 1 percent increase in percent Black, or more appropriately an average increase of .03 grade-equivalent units for each 10 percent increase in percent Black. If the sign of the coefficient were negative rather than positive, it would indicate a decrement in achievement with each increase in percent Black.

In Tables 2 and 3 are presented the coefficients for each of the two computational methods. It will be noted that the sets of coefficients are quite similar for the two procedures.

TABLE 2

PARTIAL REGRESSION COEFFICIENTS FOR PREDICTING CELL 1971 MEAN ACHIEVEMENT FROM PERCENT BLACK*

Ethnic Group / Gr.	PARAGRAPH MEANING			ARITHMETIC COMPUTATION		
	B	O	S	B	O	S
2	.0028(8) .0020(8)	.0021(6) -.0016(9)	-.0032(5) -.0152(4)	.0024(8) .0092(8)	.0002(9) -.0039(6)	-.0074(4) -.0037(5)
4	.0034(6) .0032(8)	-.0033(7) -.0019(7)	-.0005(5) .0010(6)	.0097(6) .0006(8)	-.0081(7) .0041(7)	-.0063(5) -.0003(6)
6	.0015(7) .0076(6)	-.0024(6) -.0033(9)	-.0028(7) -.0212(3)	.0071(7) .0013(7)	-.0169(8) -.0034(6)	-.0176(7) .0362(3)
8	-.0065(4) -.0078(5)	-.0181(4) .0052(5)	.0242(4) -.0017(3)	-.0487(3) -.0037(5)	-.0357(4) -.0004(5)	-.0221(4) .0040(3)

* The second variable regressed on 1971 achievement in the cell mean on the corresponding (reading or arithmetic) 1970 achievement. The 1970 coefficients are not reported. The number in parentheses denotes the number of cell means used in developing the coefficients. Coefficients for two 1971 desegregation ranks are reported for each table cell. For Blacks the top-most coefficient is for 1970 DR of 10; the second is for 1970 DR of 11. For Others and Spanish-language-origin, the top coefficient is for 1970 DR of 0, the second for 1970 DR of 1.

TABLE 3

REGRESSION COEFFICIENTS FOR PREDICTING ROW A-P CELL MEANS FROM 1971 DESEGREGATION RANK*

Ethnic Group Gr.	PARAGRAPH MEANING			ARITHMETIC COMPUTATION		
	B	O	S	B	O	S
2	.0019(8) .0022(8)	-.0036(9) .0022(6)	-.0037(5) .0011(4)	.0025(8) .0094(8)	-.0029(9) -.0039(6)	.0037(5) -.0021(4)
4	.0029(6) .0047(8)	-.0034(7) -.0026(8)	.0019(5) -.0347(7)	.0118(6) .0002(8)	-.0080(7) -.0009(8)	-.0038(5) .0083(6)
6	.0010(7) .0067(7)	-.0017(9) -.0025(6)	-.0029(7) -.0040(3)	.0002(7) .0001(7)	-.0079(9) -.0024(6)	-.0087(7) -.0069(3)
8	-.0176(3) -.0059(5)	-.0084(4) .0054(5)	-.0056(4) -.0024(3)	.0055(3) -.0017(5)	-.0303(4) .0050(6)	-.0197(4) .0100(3)

* There are two coefficients for each ethnic group at each grade. For Blacks the first coefficient is that corresponding to 70 DR 10; the second is for 1970 DR of 11. For Others and Spanish-language-origin pupils, the top coefficient is for 1970 DR 0; the second is for 1970 DR of 1. The number in parentheses indicates the number of cells used in developing the regression coefficients. Note that the coefficients are developed for cell means, not individual scores.

Since the coefficients for the elementary and for junior high grades differ appreciably, we shall separate our discussion along these lines.

GRADES 2, 4, and 6

At the elementary grades Black achievement is consistently and positively related to percent Black. In essence, with 1970 achievement controlled, Black pupils attending predominately and virtually Black schools in both 1970 and 1971 achieved higher than those who moved from predominately and virtually Black schools in 1970 to lower percent Black schools in 1971. Further, their achievement tended to decrease as 1971 percent Black decreased. On the average, across the three elementary grades an increase of 10 percent Black was associated with a decrement of approximately .03 grade equivalents in reading achievement. For arithmetic achievement the increment is slightly higher, though more inconsistent from one to another 1970 DR and one to another grade.

For Other and SLO pupils in the elementary grades, achievement tended to decline as percent Black in school increased. For Other and SLO pupils, the grade-equivalent decrease associated with a 10 percent increase in percent Black is about .05 units in reading. For mathematics the decrement averages about .04 for Others and about .05 for SLO pupils.[1]

Hence, at the elementary level ethnic desegregation does not appear to benefit the achievement of SLO and Other pupils who during 1969-70 attended schools predominately or virtually non-Black schools and in 1970-71 attended schools of higher percent Black. Similarly, Black pupils who in 1969-70 and 1970-71 attended predominately and virtually Black schools evidenced better academic gains than those who in 1970-71 were shifted to schools of lesser percent Black.

GRADE 8

At the junior high levels the evidence of desegregation effects is less conclusive than that at the elementary years.

At the junior high level, for all ethnic groups on both types of achievement, the bulk of the coefficients are negative, indicating that, on the average, an increase in percent Black from 1970 to 1971 is associated with lower levels of achievement irrespective of the ethnic group considered. The magnitude of the coefficients fluxuates considerably, but their average does not differ appreciably from the elementary grade coefficients. (The average decrement is about -.04 or slightly higher for each increase of 10 percent Black.) Though not reported, data on grade 7 follows the same pattern as that for grade 8. Grade 9 did not have sufficient variation from 1970 to 1971 in percent Black to warrant analysis.

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[1] The difference between the magnitude of these coefficients should not be emphasized as they probably reflect considerable error: of primary interest is the sign of the coefficients and the extent to which they are consistent within grades and 1970 DR's.

We have noted earlier that the linkage problems of the SAT test levels are problematic at the higher grades. It is possible that linkage problems and differential school effectiveness may be producing arbitrary results at the junior high levels. However, at present, we cannot distinguish between these possibilities and an actual change in the desegregation effect from the elementary to junior high grades.

Relationship Between Teacher Shift and Student Achievement

The percentage of shift in teaching staff at schools was analyzed in relation to the change in student achievement (actual minus predicted scores). The correlations are presented in the first column of Table 4. Of the 22 correlations, 11 could be expected by chance to be negative. Eight are negative, not a significant difference from the 11 expected. By chance, we would expect between one and two correlation coefficients to be statistically significant. Two are. Taking these facts together, we conclude that a slight positive trend in the data exists, probably due to chance fluctuations.

When the percentage of Black teacher shift is compared with expected achievement, an opposite trend occurs. Thirteen of the correlation coefficients are negative. This, however, is closer to the 11 expected than before. On the other hand, four coefficients are significantly negative, a rather rare statistical occurrence with respect to chance. The data indicate that schools from which a higher percentage of Black teachers were transferred tended to offer less opportunity for students to achieve their expected scores the following year, at least at some grade levels and for some subject areas. The trend is not strong enough to justify more extensive analysis, but it mandates a continuing analysis along these lines for the 1971-72 school year.

TABLE 4

RELATIONSHIP BETWEEN TEACHER SHIFT AND GENERAL STUDENT ACHIEVEMENT

Grade	Teacher Shift and Student Achievement			Black Teacher Shift and Student Achievement
	N		r	r
2	(140)	PM[1]	.004	.018
	(140)	AC[2]	.153	-.232**
3	(140)	PM	.093	-.081
	(140)	AC	-.027	.007
4	(136)	PM	.182*	-.279**
	(136)	AC	.089	-.048
5	(135)	PM	.030	-.089
	(135)	AC	.248**	-.201*
6	(135)	PM	.048	-.044
	(135)	AC	.034	.036
7	(34)	PM	-.120	.080
	(34)	AC	-.061	.070
8	(34)	PM	.026	-.110
	(34)	AC	.314	-.379*
9	(38)	PM	-.036	-.084
	(38)	AC	.013	.024
10	(17)	PM	-.095	-.186
	(17)	AC	-.258	.247
11	(17)	PM	.077	-.272
	(17)	AC	-.142	.232
12	(17)	PM	.302	-.549*
	(17)	AC	-.272	.194

*Significant at .05 level

**Significant at .01 level

[1] Reading index

[2] Mathematics index

UD 013 100

The section of the results relating to achievement ends at this point and is followed by an analysis of some of the variables contributing to the desegregation outcomes. The first topic reported in this section concerns the effects of the court-ordered desegregation requirements and specially funded activities upon the organization and operation of the school system.

Changes in Ethnic Composition of Instructional Staff

According to court-ordered desegregation each school's faculty should be composed of the following percentages:

24	percent racial minority in elementary schools
21	percent racial minority in junior high schools
12.2	percent racial minority in senior high schools

Table 5 shows percent Black teachers by school before (June, 1969) and after (June, 1970) teacher desegregation. In addition, September, 1971 figures are provided so that any trend toward resegregation may be seen.

We would expect that compliance would imply average percent Black to accord with court-ordered ratios and, further, that there would be little variation across schools. Statistical means and standard deviations are used to determine the averages and amount of variation, respectively, for the school levels. These computations are shown in Table 5.

The data in Table 6 show that the mean for each school year (1969-70, 1970-71, 1971-72) at each school level generally met with the court-ordered ratios while the standard deviations substantially declined.

The data indicates, therefore, that before desegregation there were extreme cases in the distribution of schools throughout the county where some schools had predominantly Black instructors while some had none. This was markedly changed during and after desegregation, i.e., the percentage of Black teachers in the Dade County Public Schools was distributed more equally in accordance with court-ordered desegregation. This positive trend is presently being maintained, although the standard deviations have increased slightly.

TABLE 5

DISTRIBUTION OF SCHOOLS BY PERCENT BLACK TEACHERS IN 1969-70, 1970-71 AND 1971-72 RANKED BY PERCENT IN 1969-70

School	June 1969	June 1970	September 1971
ELEMENTARY SCHOOLS			
Martin, Frank C.	92.9	22.8	38.5
Bethune	91.5	31.4	36.0
Allapattah	90.6	27.7	33.3
Bunche Park	88.1	21.9	28.0
Floral Heights	86.8	30.8	33.3
Douglas	84.7	30.8	28.0
Orchard Villa	84.6	28.6	30.6
Pine Villa	82.0	28.0	31.3
Dunbar	80.9	32.6	40.5
Holmes	80.0	30.2	38.5
Olinda	80.0	38.9	40.6
Goulds	80.0	26.7	26.7
Rainbow Park	78.8	31.3	39.3
King, Martin L.	78.6	58.3	57.1
Poinciana Park	78.1	26.4	30.0
West Homestead	75.0	33.3	43.3
Moton, R. R.	75.0	30.8	36.8
Young, Nathan	75.0	28.0	30.4
Evans, Lillie C.	74.5	29.8	32.6
North County	73.5	27.5	33.3
Wheatly, Phyllis	73.1	24.3	28.2
Liberty City	72.3	29.3	35.1
Lewis, A. L.	71.0	28.6	20.6
Carver, George	67.9	20.8	20.8
Drew, Charles	66.7	32.6	29.8
Lorah Park	65.6	24.1	20.8
West Dunbar	65.6	30.3	29.0
Tucker	64.9	31.3	38.1

Table 5 Continued

School	June 1969	June 1970	September 1971
Earlington Heights	60.5	25.6	28.9
Arcola Lakes	59.3	23.1	21.6
Richmond	53.8	22.2	24.1
Naranja	48.1	29.6	29.6
Pharr, Kelsey	46.7	28.6	31.7
Gladeview	41.0	29.0	31.6
Ludlam	34.6	24.0	26.1
West Little River	26.7	29.5	26.3
Edison Park	26.5	25.6	32.6
Bright, James E.	23.5	32.3	23.7
Santa Clara	21.4	20.7	20.8
Coconut Grove	20.0	25.0	20.8
Merrick	18.1	18.2	28.6
Little River	18.0	25.0	29.8
Golden Glades	16.7	31.3	26.7
Bay Harbor	15.4	21.4	21.4
Primary C	15.4	53.8	46.7
Shadowlawn	14.8	28.1	24.2
South Beach	14.3	25.0	20.0
Johnson, J. W.	14.3	25.0	28.6
Miami Gardens	12.5	24.0	25.9
Broadmoor	12.5	24.4	25.0
Florida City	12.5	25.0	22.2
Melrose	12.1	27.8	28.1
Fienberg, Leroy D.	12.0	18.5	16.0
Ojus	11.8	29.4	26.7
Norwood	11.5	23.1	21.4
Lakeview	11.5	23.1	23.1
North Carol City	11.1	25.0	25.8
Dade	10.7	26.7	28.0
Miami Lakes	10.7	24.2	28.0
Leisure City	10.5	25.6	24.3
Springview	10.5	25.0	26.3
Biscayne Gardens	10.5	23.8	26.3

Table 5 Continued

School	June 1969	June 1970	September 1971
Comstock	10.4	25.0	21.8
Shenandoah	10.3	25.0	26.2
Bryan, William J.	10.0	25.0	23.1
Fulford	10.0	23.8	28.6
Norland	10.0	20.2	21.2
Meadowlane	10.0	23.3	21.9
Snapper Creek	10.0	17.9	18.5
Perrine	10.0	23.5	23.3
Redondo	10.0	26.7	18.8
Flamingo	09.7	21.9	21.9
Olympia Heights	09.4	21.2	20.7
Oak Grove	09.1	25.0	23.8
Palm Springs North	08.8	30.0	23.8
Hibiscus	08.7	31.6	29.2
Morningside	08.7	30.0	23.8
Parkway	08.3	26.1	30.0
Parkview	08.3	27.7	19.0
Miami Springs	08.3	20.0	23.8
Colonia Drive	08.3	15.4	23.1
Key Biscayne	08.3	26.1	20.0
Kinloch Park	08.3	25.9	27.6
Fairchild	08.3	25.0	23.8
Gulfstream	08.3	24.0	21.7
Carol City	08.2	23.8	22.5
Air Base	08.2	21.6	20.0
Gratigny	08.0	24.0	22.7
Greynolds Park	08.0	21.7	27.3
Highland Oaks	08.0	23.1	14.8
Ives, Madie	08.0	18.5	25.0
North Beach	07.7	30.8	22.2
North Miami	07.7	14.3	19.0
Westview	07.7	25.0	20.8
Sabal Palm	07.5	21.1	20.0
Hialeah	07.5	22.7	25.6

Table 5 Continued

School	June 1969	June 1970	September 1971
North Glade	07.0	23.3	26.1
North Hialeah	07.0	33.3	22.6
Buena Vista	07.0	31.8	33.3
Cooper, N. K.	07.0	25.9	22.2
Coral Reef	07.0	20.5	24.2
Opa-Locka	07.0	24.4	22.5
Franklin, Benjamin	06.9	23.3	25.9
South Hialeah	06.8	22.7	22.9
Natural Bridge	06.7	28.6	28.6
Citrus Grove	06.7	22.6	24.1
Palm Springs	06.7	25.0	22.6
West Laboratory	06.7	26.7	25.0
Rockway	06.7	20.0	21.4
Village Green	06.7	25.0	22.6
South Miami Heights	06.5	25.9	21.9
Emerson	06.3	23.5	20.6
Scott Lake	06.1	25.8	23.1
Blue Lakes	06.1	30.0	22.2
Treasure Island	05.9	23.5	25.0
Earhart, Amelia	05.9	20.0	20.6
Cypress	05.9	17.6	24.1
Kendale	05.9	24.3	26.3
Pinecrest	05.9	22.9	23.3
Everglades	05.7	22.9	22.6
Southside	05.3	26.7	26.7
Tropical	05.3	19.6	18.9
Sunset	05.1	21.2	20.8
Kenwood	05.1	24.3	21.4
Palmetto	05.1	24.3	25.9
Biscayne Gardens	04.8	26.3	24.3
North Twin Lakes	04.8	17.6	21.1
Coral Way	04.5	21.6	19.6
Greenglade	04.5	26.1	24.0

Table 5 Continued

School	June 1969	June 1970	September 1971
Dupuis	04.3	23.8	19.0
Curtiss	04.3	28.6	21.7
Riverside	04.3	26.3	30.8
Coral Terrace	04.2	23.1	18.5
South Miami	04.2	24.0	26.1
Miami Park	04.1	18.0	22.4
Walters	04.0	23.3	25.6
Crestview	03.8	20.8	19.2
Miramar	03.8	28.6	23.8
Coral Gables	03.7	27.6	26.1
Flagler	03.7	24.0	23.3
Milam	03.6	19.2	20.0
Silver Bluff	03.6	21.4	18.2
Flagami	03.6	22.2	22.2
Twin Lakes	03.4	20.7	19.2
Banyan	03.4	28.1	19.2
Whispering Pines	03.3	22.6	17.9
Royal Palm	03.3	21.9	21.2
Sylvania Heights	03.3	20.6	22.2
Myrtle Grove	03.2	28.1	28.2
Blanton, Van E.	03.2	30.3	32.3
Fairlawn	03.2	23.3	24.1
Seminole	03.0	18.2	21.2
Redland	03.0	18.5	17.9
Vineland	02.6	25.6	26.9
Howard Drive	02.6	20.0	20.7
Auburndale	02.5	18.2	13.2
Coral Park	02.5	22.2	21.9
Miami Heights	02.4	21.1	20.6
Cutler Ridge	02.1	26.3	20.5
Kensington Park	02.0	22.0	23.1
Miami Shores	00.0	23.7	22.2
Avocado	00.0	21.7	23.1

Table 5 Continued

School	June 1969	June 1970	September 1971
JUNIOR HIGH SCHOOLS			
North Dade	83.7	23.4	15.9
Brownsville	75.8	25.9	26.7
Drew, Charles R.	74.7	32.9	36.9
Carver, George W.	71.4	20.0	20.0
Allapattah	68.8	21.1	27.4
Washington, Booker T.	68.1	23.3	25.9
Shenandoah	57.0	21.9	24.1
Richmond Heights	47.4	23.1	20.3
Mays	40.5	25.6	25.6
Madison	23.7	27.1	24.1
Lee, Robert E.	20.7	23.2	26.9
Edison Middle	18.6	23.0	27.7
Homestead	17.7	20.3	25.0
North Miami	12.9	23.3	23.6
Carol City	12.3	21.3	17.7
Cutler Ridge	11.3	24.4	22.9
Fisher, Ida M.	10.8	23.1	22.5
Mann, Horace	10.5	09.1	25.0
Jefferson, Thomas	10.3	19.6	21.1
Ponce De Leon	09.2	21.1	22.1
Redland	08.8	14.3	16.2
Merritt, Ada	08.5	21.9	21.4
Parkway	08.2	20.3	22.1
Palm Springs	08.2	18.1	15.9
Norland	07.9	22.5	22.1
South Miami	06.9	17.9	16.0
Nautilus	06.8	20.6	22.0
Filer, Henry H.	06.5	20.9	20.9
Kennedy, John F.	06.3	20.7	24.6
Citrus Grove	06.3	20.0	22.4
West Miami	05.6	20.0	18.2
Hialeah	05.3	21.6	20.0

Table 5 Continued

School	June 1969	June 1970	September 1971
Westview	04.8	25.0	23.2
Rockway	04.3	23.9	23.2
Riveria	03.5	20.5	17.8
Glades	03.0	22.4	23.8
Kinloch Park	02.7	17.9	14.7
Palmetto	02.6	18.8	21.4
Miami Springs	02.4	24.4	29.4
SENIOR HIGH SCHOOLS			
Miami Northwestern	67.9	22.9	23.5
Miami Jackson	27.8	13.2	15.2
South Dade	25.0	12.8	13.8
Miami Central	23.9	17.9	16.1
Miami Edison	17.5	17.1	18.6
Miami Carol City	10.4	14.3	17.6
Miami Killian	09.2	11.3	10.8
Miami Beach	08.3	12.1	13.8
Coral Gables	08.3	10.2	11.8
Miami Palmetto	08.3	10.8	12.4
North Miami	07.6	12.6	12.5
Miami Norland	06.9	13.8	14.5
Miami Springs	05.8	13.6	12.4
Hialeah	03.8	13.9	10.5
Miami Senior	03.5	12.0	10.0
Southwest Miami	02.6	08.9	10.3
Miami Coral Park	00.7	12.2	09.8[1]

[1] Department of Administrative Research, Dade County Public Schools, Desegregation, September, 1969, Vol. XVII, Number 3, 1969-70, Miami, Florida, pp. 11, 15, 19, 23, 27, 31, 35, 39.

TABLE 6

MEANS AND STANDARD DEVIATIONS FOR THE DISTRIBUTION OF SCHOOLS BY PERCENT BLACK TEACHERS

Schools	June 1969	June 1970	September 1971
Elementary			
M	21.59	25.27	25.41
S.D.	27.59	5.31	6.10
Junior High			
M	21.90	21.65	22.48
S.D.	25.37	3.70	4.32
Senior High			
M	13.97	13.51	13.74
S.D.	16.09	3.29	3.64

Changes in Student Ethnic Composition as Related to Desegregation

Unlike the situation with teacher desegregation, the court decisions did not set specified ratios of student ethnic populations to be achieved countywide. Rather, 70 schools were considered targets for student desegregation. We have presented in Table 7 the status of desegregation in Dade County as a whole, but significant changes in the ethnic ratios will be noted only for the 70 target schools. Table 7 shows the countywide ethnic composition of students at each school for the periods June 1969, June 1970, and September 1971. The data are presented in terms of percentage Black, Spanish-language-origin, and Other at each school.

TABLE 7
ETHNIC COMPOSITION OF STUDENTS

Schools	May 1969			May 1969-70			May 1970-71			May 1971-72		
	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish
ELEMENTARY												
Bunche Park*	00.0	100.0	00.0	00.0	100.0	00.0	40.6	59.4	00.0	36.9	59.9	03.2
Drew	00.0	100.0	00.0	00.0	100.0	00.0	00.0	100.0	00.0	00.0	100.0	00.0
Earlington Heights	00.0	99.9	00.1	00.0	100.0	00.0	00.1	99.8	00.1	00.6	99.1	00.3
Evans, Lillie	00.0	100.0	00.0	00.0	100.0	00.0	00.0	99.6	00.4	00.0	100.0	00.0
Floral Heights	00.0	100.0	00.0	00.0	100.0	00.0	00.0	100.0	00.0	00.0	100.0	00.0
Holmes*	00.0	100.0	00.0	00.0	100.0	00.0	05.9	94.1	00.0	01.1	95.4	03.5
King, Martin	00.0	100.0	00.0	00.0	100.0	00.0	14.9	52.8	32.3	11.2	59.0	29.8
Lewis, A. L. *	00.0	100.0	00.0	00.0	100.0	00.0	23.9	76.1	00.0	24.4	73.5	02.1
Lorah Park*	00.0	100.0	00.0	00.0	100.0	00.0	16.2	76.9	06.9	14.7	77.5	07.8
Martin, Frank*	00.0	100.0	00.0	00.0	100.0	00.0	29.1	70.9	00.0	62.1	37.9	00.0
Pharr, Kelsey*	00.0	100.0	00.0	00.0	100.0	00.0	12.0	55.8	32.2	06.4	52.9	40.7
Poinciana Park	00.0	100.0	00.0	00.0	100.0	00.0	00.0	100.0	00.0	00.0	100.0	00.0
Tucker*	00.0	100.0	00.0	00.0	100.0	00.0	06.1	85.4	08.5	03.6	82.8	13.6
West Homestead*	00.0	99.0	01.0	00.0	100.0	00.0	24.9	69.3	05.8	23.8	72.5	03.7
Liberty City	00.1	99.9	0.00	00.1	99.9	00.0	00.0	100.0	00.0	00.0	100.0	00.0
Rainbow Park*	00.1	99.9	00.0	00.1	99.9	00.0	37.7	49.2	13.1	28.9	62.0	09.1
Carver, George*	00.2	99.8	00.0	00.2	99.8	00.0	34.9	65.1	00.0	42.3	49.4	08.3
Pine Villa*	00.0	97.0	03.0	00.2	99.8	00.0	03.7	93.8	02.5	04.3	94.0	01.7
Bethune*	00.7	99.3	00.0	00.3	99.7	00.0	10.5	72.6	16.9	12.9	67.4	19.7

* Court-ordered desegregated schools

Table 7 Continued

Schools	May 1969			May 1969-70			May 1970-71			May 1971-72		
	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish
Olinda	00.0	100.0	00.0	00.3	99.7	00.0	00.0	99.9	00.1	00.0	100.0	00.0
Orchard Villa	00.0	99.5	00.5	00.4	99.6	00.0	00.0	100.0	00.0	00.0	100.0	00.0
Wheatley*	00.2	99.8	00.0	00.2	99.6	00.2	04.6	61.5	33.9	02.6	54.5	42.9
Richmond*	00.0	98.7	01.3	00.0	99.3	00.7	19.1	77.4	03.5	23.1	73.4	03.5
Young*	00.8	98.7	00.5	00.9	99.1	00.0	46.1	43.5	10.4	31.5	59.5	09.0
Allapattah*	00.5	99.2	00.3	00.0	99.0	01.0	00.5	83.3	16.2	00.5	83.1	16.4
Primary C	00.7	99.3	00.0	01.0	99.0	00.0	02.8	67.1	30.1	07.4	73.0	19.6
Moton*	00.7	99.2	00.1	01.1	98.9	00.0	32.8	64.3	02.9	36.4	63.6	00.0
Douglas*	00.2	97.5	02.3	00.2	98.7	01.1	01.2	72.5	26.3	01.3	68.8	29.9
Gladeview*	01.6	97.4	01.0	01.7	97.7	00.6	17.4	69.2	13.4	15.5	70.5	14.0
North County	03.9	96.1	00.0	02.6	97.4	00.4	12.1	87.9	00.5	10.06	90.9	00.4
Goulds*	00.9	96.1	03.0	00.8	95.6	03.6	09.1	85.3	05.6	06.9	88.6	04.5
Dunbar*	00.7	90.4	08.9	08.4	91.6	00.0	32.7	67.2	00.1	01.3	66.9	31.8
West Little River	05.6	88.8	05.6	05.7	90.5	03.8	22.5	56.6	20.9	19.2	61.0	19.8
Arcola Lakes*	08.4	89.0	02.6	10.9	88.4	00.7	29.2	59.2	11.6	28.5	56.9	14.6
Shadowlawn	05.8	65.8	28.4	06.0	66.7	27.3	08.7	65.0	26.3	07.9	65.1	27.0
Ludlam*	33.1	65.4	01.5	33.7	64.6	01.7	62.1	36.0	01.9	60.3	38.2	1.5
Naranja*	21.0	60.6	18.4	23.2	61.6	15.2	34.4	48.0	17.6	31.2	52.0	16.8
Coconut Grove*	37.3	60.3	02.4	37.2	60.9	01.9	38.9	57.1	04.0	39.2	59.4	01.4
Edison Park*	15.8	49.6	34.6	16.6	50.2	33.2	12.6	57.3	30.1	11.4	59.0	29.6
Golden Glades	51.6	35.3	13.1	49.9	34.7	15.4	53.4	37.0	09.6	37.0	49.9	13.1

* Court-ordered desegregated schools

Table 7 Continued

Schools	May 1969			May 1969-70			May 1970-71			May 1971-72		
	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish
Johnson	17.2	26.1	56.7	21.3	28.5	50.2	20.6	16.7	72.7	09.6	20.7	69.7
Miami Gardens	58.4	30.0	11.6	62.0	28.0	10.0	54.1	33.5	12.4	43.80	39.6	16.6
Little River*	25.2	27.7	47.1	24.1	27.5	48.4	10.1	66.1	23.8	10.50	67.5	22.00
North Carol City *	55.9	31.5	12.6	61.9	26.9	11.2	49.8	36.9	13.3	39.8	45.8	14.4
Colonial Drive	73.5	23.5	03.0	75.0	23.2	00.9	64.5	33.0	02.5	68.5	29.0	02.5
West Laboratory	76.2	23.5	00.3	76.8	23.2	00.0	76.1	23.9	00.5	76.9	22.6	00.5
Santa Clara*	04.8	20.1	75.1	06.6	22.5	70.9	01.9	70.6	27.5	01.4	67.7	30.9
Florida City*	64.2	18.3	17.5	67.6	20.2	12.2	29.8	62.3	07.9	23.8	68.6	07.6
Natural Bridge	81.6	16.1	02.3	79.8	18.5	01.7	77.9	18.2	03.9	76.6	18.6	04.8
Miramar*	08.5	17.7	73.8	09.3	18.1	72.6	05.7	49.5	44.8	03.1	53.1	43.8
West Dunbar*	03.4	14.7	81.9	02.9	17.3	79.8	02.3	62.4	35.3	03.3	58.9	37.8
Miami Park	54.1	17.6	28.3	50.1	17.2	32.7	51.5	21.6	26.9	41.9	25.9	32.2
Fulford	80.6	15.1	04.3	81.6	15.7	02.7	85.4	13.2	01.4	81.9	13.6	04.5
Myrtle Grove	62.2	14.1	23.7	67.9	13.4	18.7	56.8	16.6	26.6	41.9	18.4	39.7
Blanton*	62.2	17.0	20.8	67.5	12.6	19.9	35.6	55.1	09.3	31.5	57.6	10.9
Bright, James	13.7	11.5	74.8	23.0	11.3	65.7	14.8	12.3	72.9	17.5	18.9	63.6
Flagler,	23.3	00.8	75.9	18.5	10.0	71.5	22.1	00.6	77.3	17.2	02.2	80.6
South Miami*	78.0	10.0	12.0	82.5	09.8	07.7	65.0	25.3	09.7	64.2	26.5	09.3
Miami Springs	70.8	08.2	21.0	70.7	09.1	20.2	76.8	08.1	15.1	76.0	08.0	16.0
Air Base	88.4	08.9	02.7	89.2	08.4	02.4	88.2	09.6	02.2	90.0	07.9	02.1

* Court-ordered desegregated schools

Table 7 Continued

Schools	May 1969			May 1969-70			May 1970-71			May 1970-72		
	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish
Oak Grove	89.6	06.6	03.8	88.9	06.9	04.2	87.4	05.8	06.8	88.1	05.7	06.2
North Miami	88.2	05.7	06.1	92.5	06.5	01.0	93.0	05.9	01.1	87.2	05.9	06.9
Carol City	79.8	07.2	13.0	82.7	05.6	11.7	75.0	09.8	15.2	70.4	15.8	13.8
Ojus	93.2	04.2	02.6	92.0	05.6	02.4	92.6	04.3	03.1	92.6	05.1	02.3
Buena Vista*	06.7	04.8	88.5	06.5	05.2	88.3	04.3	43.5	52.2	04.5	32.0	63.5
North Glade	74.0	05.6	20.4	78.1	05.1	16.9	71.6	06.0	22.4	63.6	06.5	29.9
Vineland*	93.3	04.7	02.0	93.9	04.7	01.4	42.9	55.4	01.7	73.3	23.2	03.5
Cooper*	83.0	04.7	12.3	82.1	04.0	13.9	35.5	57.6	06.9	38.6	57.2	04.2
Gulfstream	93.0	03.1	03.9	94.3	03.2	02.5	88.4	04.2	07.4	88.7	03.6	07.7
Parkview*	88.8	03.6	07.6	92.7	03.1	04.2	55.6	37.9	06.5	49.7	41.5	08.8
Franklin	79.8	04.3	15.9	84.8	03.0	12.2	91.6	00.5	07.9	83.1	00.5	16.4
South Miami	91.5	03.5	05.0	94.1	02.7	03.2	96.0	00.0	04.0	92.8	04.5	02.7
Biscayne Gardens	88.7	03.0	08.3	94.6	02.4	07.0	88.6	00.7	10.7	88.6	02.1	09.3
Redland	86.4	02.3	11.3	90.4	02.4	07.2	75.6	10.1	14.3	71.2	12.5	16.3
Southside	12.7	01.5	85.8	09.9	02.4	87.7	13.0	01.8	85.2	06.5	01.3	92.2
Melrose*	26.3	00.3	73.2	27.2	02.1	70.7	14.5	53.2	32.3	10.7	49.9	39.4
Walkers	33.7	02.6	63.7	35.4	02.1	62.5	27.5	02.9	69.6	20.9	03.0	76.1
South Beach	45.0	01.8	53.2	43.3	01.9	54.8	35.7	02.8	61.5	35.1	02.6	62.3
Comstock*	13.8	01.3	83.9	18.0	01.8	80.2	06.4	29.2	64.4	05.6	25.6	68.8
Fairlawn	29.1	00.1	70.8	30.6	01.6	67.8	25.8	00.0	74.2	18.1	00.0	81.9
Perrine*	86.6	01.2	12.2	84.2	01.4	14.4	54.1	37.3	08.6	54.4	36.9	08.7

* Court-ordered desegregated schools

Table 7 Continued

Schools	May 1969			May 1969-70			May 1970-71			May 1971-72		
	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish
Dade*	30.8	01.1	68.1	91.6	01.3	07.1	35.1	53.1	11.8	16.6	56.3	27.1
Palm Springs	74.9	01.8	23.3	95.9	01.3	02.8	69.2	01.4	29.4	64.4	01.4	34.2
Broadmoor*	50.7	01.1	48.2	56.5	01.2	42.3	27.8	41.8	30.4	23.9	47.2	28.9
Earhart	59.5	01.5	39.0	62.5	01.2	36.3	59.3	02.6	38.1	53.9	02.7	43.4
Fairchild*	78.4	01.6	20.0	83.0	01.2	15.8	65.7	13.2	21.1	65.9	12.6	21.5
Morningside	64.5	00.7	34.8	69.5	01.2	29.3	61.7	02.7	35.6	55.0	03.0	42.0
Avocado	98.7	00.6	00.7	98.4	01.1	00.5	89.9	00.0	10.1	74.2	02.5	23.3
Scott Lake*	95.8	01.1	03.1	96.1	01.1	02.8	64.1	33.2	02.7	60.3	35.3	04.4
Bryan	95.7	01.1	03.2	95.4	01.0	03.6	96.3	00.6	03.1	95.2	00.5	04.3
Tropical	87.2	01.6	11.2	86.4	01.0	12.6	85.0	00.9	14.1	83.9	01.2	14.9
Westview*	79.4	00.7	19.9	80.2	01.0	18.8	46.2	33.8	20.0	36.9	46.2	16.9
Coral Way	22.1	01.0	76.9	24.8	00.9	74.3	18.2	01.2	80.6	15.3	01.0	83.7
Auburndale	16.2	00.8	83.0	16.4	00.8	82.8	14.1	01.4	84.5	13.7	01.1	85.2
Fienberg	47.8	00.8	51.4	50.8	00.8	48.4	43.1	00.8	56.1	46.8	01.3	51.9
Kensington Park	20.8	00.9	78.3	20.9	00.8	78.3	19.2	01.3	79.5	17.6	01.2	81.2
Curtiss*	68.9	00.6	30.5	64.9	00.6	34.5	25.4	50.7	23.9	24.4	57.4	18.2
Highland Oaks	97.2	00.7	02.1	99.0	00.6	00.4	98.3	00.9	00.8	97.6	00.6	01.8
Lakeview	68.3	01.1	30.6	73.7	00.6	25.7	66.5	00.9	32.6	56.7	02.7	40.6
Merrick	32.5	00.7	66.8	35.1	00.6	64.3	34.3	01.2	64.5	26.7	20.3	53.0
North Beach	84.9	00.8	14.3	86.5	00.6	12.9	84.7	02.3	13.0	80.1	03.1	16.8
Bay Harbor	99.7	00.3	00.0	99.5	00.5	00.0	97.0	00.0	03.0	96.4	00.0	03.6

*Court-ordered desegregated schools

Table 7 Continued

Schools	May 1969			May 1969-70			May 1970-71			May 1971-72		
	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish
Opa-Locka*	73.2	00.4	26.4	77.1	00.5	22.4	46.30	35.2	18.5	52.0	33.8	14.2
Treasure Island	93.9	00.7	05.4	92.5	00.5	07.0	94.20	00.9	04.9	94.0	00.7	05.3
Greenglade	80.0	00.0	20.0	83.1	00.4	16.5	79.80	00.2	20.0	76.8	00.1	23.1
Sunset *	92.9	00.5	06.6	95.2	00.4	04.4	86.00	10.1	03.9	73.4	23.3	03.3
Biscayne	76.0	00.4	23.6	75.1	00.3	24.6	71.70	00.6	27.7	69.7	01.0	29.3
Coral Terrace	59.0	00.4	40.6	62.2	00.3	37.5	51.00	00.4	48.6	53.3	00.2	46.5
DuPuis	73.4	00.2	26.4	73.0	00.3	26.7	72.6	00.3	27.1	77.1	01.4	21.5
Flamingo	48.3	00.3	51.4	28.2	00.3	71.5	22.4	00.3	77.3	37.8	00.2	62.0
Shenandoah	10.6	00.0	89.4	11.6	00.3	88.1	08.7	00.0	91.3	06.9	00.0	93.1
Sylvania Heights	54.8	00.4	44.8	59.3	00.3	40.4	57.6	01.4	41.0	53.3	00.8	45.9
Cutler Ridge	96.6	00.5	02.9	98.6	00.2	01.2	97.2	00.9	01.9	92.7	01.8	05.5
Crestview	95.1	00.0	04.9	99.1	00.1	00.8	93.6	00.6	05.8	92.7	01.1	06.2
Miami Heights	96.9	00.1	03.0	96.4	00.1	03.5	94.7	00.5	04.8	85.6	08.3	06.1
South Hialeah	30.1	00.4	69.5	39.8	00.1	60.1	24.8	00.4	74.8	21.0	00.5	78.5
Whispering Pines	98.1	00.1	01.8	97.9	00.1	02.0	95.9	00.1	04.0	95.8	00.1	04.1
Banyan	75.0	00.0	25.0	70.3	00.0	29.7	63.7	00.0	36.3	57.1	00.0	42.9
Blue Lakes	92.5	00.0	07.5	94.7	00.0	05.3	92.2	00.0	07.8	88.6	00.0	11.4
Citrus Grove	12.0	00.1	87.9	12.5	00.0	87.5	09.2	00.1	90.7	08.6	00.1	91.3
Coral Gables*	85.1	00.0	14.9	85.4	00.0	14.6	50.5	44.6	04.9	68.6	24.9	06.5
Coral Park	72.0	00.0	28.0	73.4	00.0	25.6	69.4	00.0	30.6	65.6	00.0	34.4
Coral Reef	97.3	00.0	02.7	100.0	00.0	00.0	97.8	00.6	01.6	80.3	19.7	00.0

* Court-ordered desegregated schools

Table 7 Continued

Schools	May 1969			May 1969-70			May 1970-71			May 1970-71		
	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish
Cypress	89.7	00.0	10.3	92.9	00.0	07.1	88.2	00.0	11.8	84.8	00.0	15.2
Emerson	67.7	00.0	32.3	70.3	00.0	29.7	65.7	00.0	34.3	61.1	00.0	38.9
Everglades	74.2	00.0	25.8	73.6	00.0	26.4	73.2	00.0	26.8	69.0	00.1	30.9
Flagami	72.1	00.0	27.9	74.7	00.0	25.3	68.5	00.0	31.5	65.5	00.2	34.3
Gratigny	88.1	00.0	11.9	96.1	00.0	03.9	89.4	00.6	10.0	85.5	00.6	13.9
Greynolds Park	93.0	00.0	07.0	95.3	00.0	04.7	95.7	00.0	04.3	95.1	00.0	04.9
Hialeah*	38.8	00.3	60.9	42.0	00.0	58.0	25.0	35.1	39.9	21.7	37.0	41.3
Hibiscus	96.8	0.00	03.2	96.6	00.0	03.4	95.1	00.2	04.7	96.2	00.2	03.6
Howard Drive	98.8	0.00	01.2	97.9	00.0	02.1	99.3	00.0	00.7	76.2	23.5	00.3
Ives	97.5	0.00	02.5	100.0	00.0	00.0	96.9	00.0	03.1	91.9	00.1	08.0
Kendale	94.4	0.00	05.6	100.0	00.0	00.0	86.1	00.1	13.8	92.5	00.2	07.3
Kenwood	95.6	0.00	04.4	97.3	00.0	02.7	95.5	00.3	04.2	94.6	00.5	04.9
Key Biscayne	69.1	00.2	30.7	74.8	00.0	25.2	73.7	00.2	26.1	73.5	00.5	26.0
Kinloch Park	29.8	0.00	70.2	27.1	00.0	72.9	28.8	00.3	70.9	21.5	03.0	75.5
Leisure City	91.7	0.00	08.3	89.6	00.0	10.4	95.0	00.0	05.0	93.5	00.9	05.6
Meadowlane	73.0	00.0	27.0	77.8	00.0	22.2	71.7	00.2	28.1	49.5	00.8	49.7
Miami Lakes	91.5	00.0	08.5	93.3	00.0	05.7	91.6	00.0	08.4	93.1	00.0	06.9
Miami Shores	95.3	00.5	04.2	93.5	00.0	05.5	91.9	00.8	07.3	90.7	00.8	08.5
Milam	74.3	00.0	25.7	77.4	00.0	22.6	73.9	00.0	26.1	62.7	00.0	37.3
Norland	95.5	00.0	04.5	95.6	00.0	04.4	94.6	00.0	05.4	93.3	00.0	06.7
North Hialeah	49.7	00.2	50.1	58.6	00.0	41.4	42.5	00.8	56.7	32.5	00.5	67.0

* Court-ordered desegregated schools

Table 7 Continued

Schools	May 1969			May 1969-70			May 1970-71			May 1971-72		
	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish
North Twin Lakes	74.8	00.4	24.8	80.6	00.0	19.4	71.9	00.4	27.7	67.6	00.0	32.4
Norwood	95.8	00.0	04.2	96.1	00.0	03.9	95.4	00.0	04.6	94.6	00.2	05.2
Olympia Heights	81.3	00.0	18.7	83.5	00.0	16.5	77.9	00.2	21.9	70.7	00.8	28.5
Palmetto	98.6	00.0	01.4	100.0	00.0	00.0	97.3	00.1	02.6	73.4	24.3	02.3
Palm Springs	84.2	00.0	15.8	86.9	00.0	13.1	83.5	00.0	16.5	85.2	00.0	14.8
Parkway	98.7	00.0	01.3	100.0	00.0	00.0	98.1	00.6	01.3	95.4	00.9	03.7
Pinecrest	99.0	00.1	00.9	100.0	00.0	00.0	97.3	00.0	02.7	97.3	00.0	02.7
Redondo	99.1	00.0	00.9	96.9	00.0	03.1	100.0	00.0	00.0	86.9	03.5	09.6
Riverside*	02.5	00.0	97.5	03.2	00.0	96.8	02.4	43.6	54.0	02.6	41.4	56.0
Rockway	61.7	00.0	38.3	66.3	00.0	33.7	64.8	00.1	35.1	56.7	00.1	43.2
Royal Palm	84.6	00.0	15.4	87.9	00.0	12.1	83.5	00.2	16.3	80.5	00.6	18.9
Sabal Palm	97.8	00.1	02.2	98.0	00.0	02.0	97.5	00.2	02.3	97.7	00.2	02.1
Seminole	67.4	00.0	32.6	70.2	00.0	29.8	63.7	00.0	36.3	53.3	00.2	46.5
Silver Bluff	40.5	00.0	59.5	43.6	00.0	56.4	40.6	00.1	59.3	34.8	00.4	64.8
Snapper Creek	92.9	00.2	06.9	93.5	00.0	06.5	94.2	00.0	05.8	91.8	00.0	08.2
Springview	91.1	00.0	08.9	94.1	00.0	05.9	74.6	00.1	25.3	64.7	00.2	35.1
Twin Lakes	83.9	00.0	16.1	86.7	00.0	13.3	80.7	00.0	19.3	76.9	00.0	23.1
Village Green	80.1	00.0	19.9	83.3	00.0	16.7	79.5	00.0	20.5	85.8	00.2	14.0
JUNIOR HIGH												
Carver*	00.0	100.0	00.0	00.0	100.0	00.0	51.3	38.9	09.8	49.0	41.2	09.8
North Dade*	00.0	100.0	00.0	00.0	100.0	00.0	20.3	75.3	04.4	14.2	80.0	05.8

* Court-ordered desegregated schools

Table 7 Continued

Schools	May 1969			May 1969-70			May 1970-71			May 1971-72		
	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish
Drew	00.1	99.9	99.9	99.0	99.9	00.0	00.0	100.0	00.0	00.0	100.0	00.0
Brownsville *	00.2	99.8	00.0	00.0	99.8	00.2	14.0	76.1	09.8	17.9	71.7	10.4
Washington*	00.2	98.9	00.9	00.0	99.6	00.2	05.7	39.4	54.9	02.7	37.5	59.8
Allapattah*	00.1	99.3	00.6	00.0	99.0	00.7	06.2	70.0	23.8	03.8	71.7	24.5
Richmond Heights*	31.0	68.4	00.6	31.6	67.9	00.5	45.3	54.4	00.3	49.9	49.1	01.2
Miami Edison*	13.4	61.9	24.7	20.5	66.7	12.8	17.3	56.1	26.6	15.0	60.4	24.6
Madison	37.2	50.0	12.8	- -	48.8	- -	42.5	47.0	10.5	28.7	50.0	21.3
Mays	57.4	40.8	01.8	60.2	39.8	00.0	59.3	39.3	01.4	56.9	37.1	06.0
Homestead	60.6	36.0	03.4	60.8	36.3	02.9	58.1	38.7	02.4	55.8	39.2	05.0
Lee*	12.3	28.8	58.9	19.8	31.3	48.9	06.1	59.4	33.7	05.8	59.6	34.6
Fisher	46.1	24.9	29.0	47.2	26.3	26.5	49.4	23.9	26.7	40.6	23.7	35.7
Carol City	64.9	24.2	10.9	68.5	25.4	06.1	64.8	24.1	11.1	53.3	28.3	18.4
Mann	59.9	25.1	15.0	63.3	23.2	13.5	56.8	28.5	14.7	52.9	30.6	16.5
Cutler Ridge	77.0	20.8	02.2	77.0	21.8	01.2	76.0	21.1	02.9	75.6	21.4	03.0
Redland	72.5	22.5	05.5	77.2	20.2	02.6	68.3	23.7	08.0	68.2	22.5	09.3
South Miami	78.9	16.3	04.8	81.4	15.8	02.8	77.5	18.9	03.6	75.6	19.4	05.0
Parkway	72.4	22.1	05.5	85.6	14.0	00.4	75.2	22.2	02.6	66.4	27.3	06.3
Ponce De Leon*	77.1	07.4	15.5	78.9	06.9	14.2	54.7	27.1	18.2	54.7	29.3	15.5
Filer	39.0	08.2	52.8	47.9	04.6	47.5	25.1	09.0	65.9	31.6	08.6	59.8
North Miami	82.9	12.1	05.0	90.9	03.7	05.4	82.4	13.0	04.3	83.5	11.3	05.2
Jefferson	84.7	11.6	03.7	92.5	03.6	03.9	83.2	13.5	03.3	79.5	13.8	06.7

* Court-ordered desegregated schools

Table 7 Continued

Schools	May 1969			May 1969-70			May 1970-71			May 1971-72		
	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish
Nautilus	77.6	11.1	11.3	93.5	02.8	03.7	77.6	11.3	11.1	74.0	13.5	12.5
Kennedy	89.3	08.1	02.6	96.1	02.0	01.9	88.0	10.0	02.0	88.0	10.2	01.8
Merritt*	03.7	01.9	94.4	04.0	01.6	94.4	06.5	36.0	57.5	05.6	39.7	54.7
Kinloch Park	32.6	00.1	67.3	25.6	01.5	72.9	27.6	01.5	70.9	25.6	01.6	72.8
Miami Springs*	58.4	07.6	34.0	64.9	01.5	33.6	27.9	54.3	17.8	22.5	61.9	15.6
Palmetto	97.3	01.3	01.4	96.9	01.5	01.6	96.4	01.8	01.8	95.4	01.9	02.7
Citrus Grove*	12.5	00.2	87.3	12.3	01.3	86.4	05.2	35.2	59.6	07.0	33.0	60.0
Hialeah	65.7	05.0	29.3	65.0	01.3	34.7	66.0	07.7	26.3	54.3	09.7	36.0
Westview *	72.0	10.7	17.3	80.3	00.9	18.8	55.1	24.9	20.0	51.5	29.4	19.1
Riviera	87.9	00.6	11.5	86.9	00.5	12.6	85.6	00.3	14.1	87.6	00.2	12.2
Shenandoah	37.8	00.3	61.8	39.6	00.2	60.2	34.7	00.3	65.0	29.9	00.2	69.9
Glades	96.2	00.1	03.7	95.4	00.1	04.5	98.9	00.1	01.0	93.9	00.2	05.9
Norland	93.7	02.3	04.0	96.3	00.0	03.7	89.4	06.9	03.7	85.0	10.2	04.8
Palm Springs	83.0	00.0	17.0	84.7	00.0	15.3	81.8	00.0	18.2	81.0	00.0	19.0
Rockway	79.8	00.0	20.2	80.6	00.0	19.4	77.1	00.0	22.9	72.4	00.0	27.6
West Miami	77.4	00.1	22.5	81.4	00.0	18.6	71.7	00.1	28.2	68.4	00.0	31.6
SENIOR HIGH												
Mia. Northwestern	00.0	99.9	00.1	00.0	99.9	00.0	00.0	99.9	00.1	00.1	99.8	00.1
Mia. Jackson*	02.5	92.9	04.6	02.7	92.5	04.8	02.2	88.9	08.9	04.5	83.3	12.2
Miami Edison*	40.4	39.0	20.6	39.2	40.2	20.6	41.0	40.00	19.0	39.7	46.0	14.3

* Court-ordered desegregated schools

Table 7 Continued

Schools	May 1969			May 1969-70			May 1970-71			May 1971-72		
	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish	Percent Other	Percent Black	Percent Spanish
South Dade	65.0	33.7	01.3	65.2	33.4	01.4	63.0	35.2	01.8	60.6	36.7	02.7
Miami Central	60.2	30.0	09.8	63.6	28.7	07.7	49.2	36.0	14.8	50.0	42.3	07.7
Mia. Carol City	65.6	28.3	06.1	68.1	26.9	05.0	65.9	26.4	07.7	62.4	26.0	11.6
Miami Killian	75.8	21.5	02.7	76.6	21.2	02.2	78.5	21.0	00.5	77.1	21.3	01.6
Coral Gables	69.6	13.1	17.3	70.2	13.1	16.7	67.7	15.5	16.8	68.7	16.4	14.9
Mia. Palmetto	90.0	09.1	00.9	89.4	09.8	00.8	89.1	09.8	01.1	87.	11.5	01.3
Miami Norland*	90.2	07.6	02.2	91.0	06.7	02.3	83.6	14.0	02.4	81.3	15.7	03.0
Miami Springs	58.1	02.2	39.7	48.0	05.1	46.9	51.5	09.9	38.6	45.2	15.1	39.7
Southwest Miami	87.5	05.0	07.5	88.8	05.1	06.1	86.7	04.9	08.4	87.4	02.3	10.3
Miami Beach	80.9	02.2	16.9	80.1	02.4	17.5	76.0	08.5	15.5	69.7	14.1	16.2
North Miami	93.3	01.9	04.8	94.4	01.8	03.8	91.9	03.8	04.3	88.1	07.0	04.9
Miami Senior	24.1	00.6	75.3	23.9	00.8	75.3	19.6	03.8	76.6	16.6	05.3	78.1
Hialeah	76.6	00.1	23.3	80.7	00.1	19.2	74.3	00.1	25.6	73.9	00.3	25.8
Miami Coral Park	74.7	00.0	25.3	78.3	00.0	21.7	77.0	00.0	22.9	66.8	00.0	33.2

* Court-ordered desegregated schools

In order to summarize the above data, the means and standard deviations for the percent Black columns were computed individually for elementary, junior high, and senior high schools. The data are presented in Table 8.

TABLE 8

MEANS AND STANDARD DEVIATIONS FOR
THE COUNTYWIDE DISTRIBUTION OF
BLACK STUDENTS

Schools	June 1969	June 1970	September 1971
Elementary			
M	26.53	26.71	27.55
S.D.	40.02	32.47	31.89
Junior High			
M	29.25	28.47	29.47
S.D.	37.24	25.21	25.47
Senior High			
M	22.81	24.57	26.07
S.D.	30.41	29.21	28.38

The data in Table 8 indicate that the distribution of Black students throughout the county became more uniform after desegregation in 1970 and 1971 when compared with the degree of desegregation prior to the court orders (June, 1969).

There are less extreme cases where schools have predominantly Black students or none at all. While some schools still have an all Black or all white student body, their number has steadily declined since 1970.

Table 9 shows the distribution of Black students for the target schools, i.e., schools directly involved with court-ordered desegregation.

TABLE 9

MEANS AND STANDARD DEVIATIONS FOR THE DISTRIBUTION OF BLACK STUDENTS IN TARGET SCHOOLS

Schools	June 1969	June 1970	September 1971
Elementary			
M	50.51	55.85	55.27
S.D.	44.66	19.22	19.35
Junior High			
M	52.04	49.78	51.15
S.D.	45.25	17.53	17.39
Senior High			
M	46.24	47.63	48.33
S.D.	43.24	38.03	33.86

It can be discerned from the standard deviations in Table 9 that there was a more uniform distribution of Black students in the target schools--especially at the elementary and junior high school level. That this continues to be the case is evidenced by the above data.

Effects of Desegregation on Principals

The 70 principals of schools where court decisions required student desegregation answered a questionnaire concerning their perceptions of the desegregation process. When asked to comment on organizational changes brought about in desegregated schools, no generalized trend was noticeable in the way the principals answered. Many organizational changes were stated but apparently what was true for one school often did not hold true for another.

The most common organizational change was the addition of teacher aides and teachers. Twenty-nine of the principals indicated such additions.

Assistant principals were added in some schools, some being assigned to community relations and others to grade levels within the school. Parent aides were added in one school. Counselors and visiting teachers were added as personnel to ten schools. Twelve principals mentioned that grouping of students was a significant addition to their operating strategies. Individual schools noted the addition to their curriculum of home economics programs, industrial arts programs, and English as a second language. Student grading policies were altered in one school; school schedules were changed in another.

When the focus is changed from general organizational procedures used by the principals in student desegregated schools to instructional strategies, some common trends are noted. Changes made at the teacher level included nine schools where team teaching was added and five at which in-service programs were stressed. Within the curriculum area, nine schools placed social emphasis on language arts and mathematics while nine others stressed multi-level reading materials.

The most common trend occurred in reference to how students were grouped for instructional purposes. Forty principals indicated that ability grouping was the procedure used as opposed to heterogeneous grouping or individualized instruction.

Human relations training and the employment of the human relations team were strategies used by the school system to prepare principals, parents, and students to interact in a positive manner. The human relations training offered to principals was diverse in nature and consisted of several different programs. Seminars, courses at some of the community colleges, district meetings, weekend workshops, staff development courses and interactional meetings, and various practicums were the types of programs offered. Sixteen of the 70 principals participated in three or more types of human relations training. Forty-nine had at least one type of human relations training, and only three did not participate in any programs.

The Staff Development Department of Dade Public Schools hired human relations consultants who were paired and provided as a team to schools requesting their services in human relations endeavors felt to be needed by the school personnel. Sixteen of the 70 principals made use of this service. Seven of the schools used the team in faculty meetings, three schools provided an orientation week for teachers in which the human relations team participated. Individual schools used the team in sensitivity workshops, helping teachers with specified problems and providing a workshop for parents.

Principals did encounter problems with their desegregation efforts. Seven principals discovered that their instructional program was inadequate to meet the needs of their new student population. Five administrators reported difficulties with student transportation. Six principals noted a lack of understanding of cultural differences. Six felt that the low achievement of new pupils presented a difficult problem. Nine principals reported some concern in handling the fears and/or lack of involvement of parents, and ten schools noted difficulties with student discipline.

A total of 48 principals did respond that problems had been intensified by desegregation. Thirty-six of the principals felt there was too little security at their schools with respect to materials, supplies, and school property.

The effect of all of these changes upon school organization and procedures might have been expected to have affected principal morale very negatively. Evidence, however, does not indicate that this is so. The great majority of principals involved in student desegregation planned to continue as principals in the same schools in subsequent years. Only twelve principals indicated they would not be principals in the following year within the same schools. The locations of those who were not planning to continue did not appear to relate to desegregation conditions, since there was no correlation between determination to remain as principal and degrees of shift in either teacher or student ethnic populations.

Forty-six of the principals described their position as principal in Dade County as good to excellent. Again, the relationship between satisfaction experienced in the principal's position was unrelated to shifts in student or teacher ethnic populations suggesting that the degree of desegregation does not relate to principal morale.

Good morale is suggested in the degree to which principals reacted to support from district or central administrative offices. Forty-four of the principals were positive in that support, while only one principal indicated a negative reaction.

Most of the principals apparently felt that desegregation was having a generally positive effect for Black students. Sixty of the principals stated that the rate of learning for Black students in desegregated schools was either equal to or above expectations for the group. Twenty-five of the principals perceived that Black students were learning at a rate above usual for the group. Only six of the principals felt that the Black achievement rate had fallen off following desegregation.

Fifty-six of the 70 principals believed that the learning rate for white native English-speaking students had remained at or increased above the usual rate for that group. The same feelings were expressed with regard to the native Spanish-speaking students, where 52 principals felt that the rate had remained at or increased above the usual.

Overall, 17 principals felt that desegregation had improved student achievement, 30 felt that there had been no change in student achievement, and 13 believed that achievement had fallen off as a consequence of desegregation. Surprisingly, the principals who saw achievement declining with desegregation were located in schools which had been largely Black in their student ethnicity prior to desegregation. This finding was apparent in a slight but significant correlation of .27 between the variables of perceived achievement decline and a shifting away of Black students.

The general finding of a positive principal attitude toward desegregation is extended to their views of parental support and student attitudes toward school. Sixty-one of the principals indicated that most or all parents generally supported their school efforts to teach children and 65 principals indicated that most or all students seem to like school.

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The Initial Impact and Subsequent Changes Upon the Faculties of Student Desegregated Schools

The 70 principals of student desegregated schools were asked how desegregation had initially and subsequently affected the faculty. Sixteen of the principals noted that there were problems in this initial adjustment, but nine of the sixteen felt that the problems were being diminished over time. The most commonly noted problem was in teacher morale where anxiety, apprehension, and inexperience in teaching other ethnic groups was felt to be debilitating.

The Status After One Year Following Desegregation of Teachers Transferred as a Result of Desegregation

In February of 1970, 1,876 teachers were transferred to different schools for purposes of desegregation. Approximately one year later, in December 1971, the disposition of those teachers since their transfers was determined. Figure 17 shows the disposition of those teachers at that point in time. It may be seen that nearly one-half of the transferred teachers remained at their newly assigned location. Twenty-eight percent of them transferred to a second new location. One hundred thirty-seven teachers were able to transfer back to their original location. Approximately 18 percent of the teachers terminated employment with the system, with 12 percent terminating at the time when reassignments were made for desegregation purposes.

What the terminations mean to Dade County Public Schools in terms of teaching experience and educational levels lost from the system is shown in Table 10. It can be seen in that table that the majority of teachers who terminated had between zero and three years experience and that more than 75 percent of them were at the lowest educational level. More than one-half of the terminees were white females and nearly 25 percent were white males.

The Relationship Between Desegregation and Faculty Turnover

While the shaded areas in Figure 117 indicate that a total of 335 transferred teachers terminated employment with Dade Schools, the figure does not indicate relationships between those terminations and degrees of

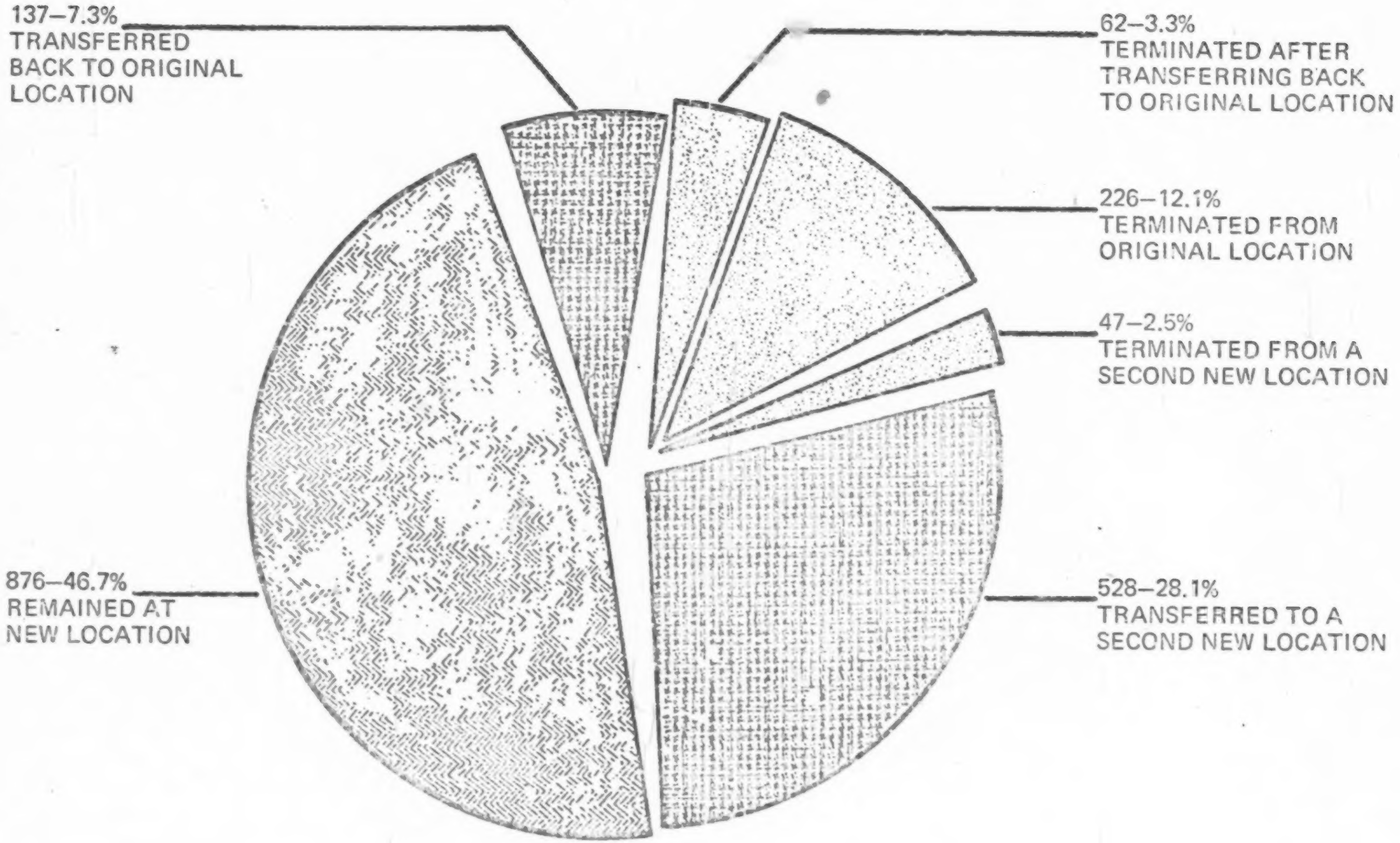

Fig. 17—Disposition of the 1,876 teachers who were transferred for purposes of school desegregation.

TABLE 10

DISPOSITION OF TRANSFERRED TEACHERS WHO TERMINATED EMPLOYMENT

DISPOSITION OF "DE JURE" DESEGREGATION TEACHERS WHO TERMINATED EMPLOYMENT														
FLORIDA TEACHING EXPERIENCE					CERTIFICATE RANK NUMBER					SEX AND ETHNICITY				
	YEARS 0-3	YEARS 4-7	YEARS 8-24	25+		1A	1	2	3		WHITE FEMALE	WHITE MALE	BLACK FEMALE	BLACK MALE
NUMBER YEARS EXP.	167	75	49	5	NUMBER	1	0	47	248	NUMBER	174	67	38	17
%	56.4%	25.3%	16.6%	1.7%	%	.3%	0%	15.9%	83.8%	%	58.8%	22.6%	12.8%	5.8%

desegregation, nor does it indicate the effects of desegregation upon faculty which was not transferred. According to the principals, very little if any relationship exists between teacher terminations and desegregation conditions. Forty-nine of 70 principals indicated that no teachers in their opinion would fail to return to the same schools because of problems associated with desegregation. Only one principal indicated that as many as five to six teachers would not return due to desegregation problems. Where principals indicated the teachers would not return to the same school on account of desegregation problems, we were unable to find any relationship with the amounts of shift in teachers or students, suggesting that the degree of desegregation does not relate to teacher terminations.

The Most Salient Problems Created for the Teachers by Desegregation

According to data obtained from a teacher questionnaire, approximately 30 percent of the teaching faculty in Dade Public Schools were affected by desegregation to the degree that problems of instruction were intensified by the process. The major problem experienced by those teachers who felt desegregation had created difficulties was disruptive student behavior. Sixty-seven percent of the teachers who had experienced increased difficulties indicated disruptive student behavior was a significant problem for them. This problem was particularly acute in formerly white schools that experienced a large influx of Black students.

Failure to meet individual needs was the second most common problem experienced by teachers who indicated increased difficulties with desegregation. Fifty-two percent of these teachers indicated this to be a severe problem, again most strongly so in the formerly white schools.

Somewhat fewer but still significant numbers of teachers experienced problems in schools which had previously been largely Black in ethnicity but experienced an influx of "other" teachers. Twenty-six percent of the teachers who indicated increased difficulties as a result of desegregation suggested that they were not being able to make full use of their teaching skills. Seven percent of teachers who had the difficulties in the desegregation process indicated problems in developing relations with Black administrators.

Personal transportation for teachers involved in the desegregation process represented a problem to 13 percent of the teachers. This problem was especially pronounced for the teachers in schools which underwent the greatest shift in the teacher and student populations.

A significant 30 percent of those who indicated difficulties intensified by desegregation had problems adjusting to student language patterns. This problem, however, and two others noted by teachers were not related to either shift in teachers or shift in students, so that we are not convinced that these problems were intensified by the desegregation process. The other problems indicated were developing relations with a new school faculty and developing relations with a new student body.

There were other conditions which teachers identified as general problems but which were also found to be related to the desegregation process. One category of problems concerned the physical conditions in which teachers operate. Although approximately two-thirds of the Dade teachers indicated that their rooms were air-conditioned, about 50 percent said that the rooms were frequently too hot. Teachers who were transferred for desegregation purposes indicated that their rooms were too hot more often than was true for teachers in general. Approximately 20 percent of all teachers indicated that noise outside their classrooms was a significant problem, but teachers who were transferred for desegregation purposes found noise outside their classrooms a problem much more frequently than teachers in general.

About one in every 15 teachers suggested difficulties in delivery of supplies. Surprisingly, the teachers who encountered problems in the delivery of supplies were often teachers who were not transferred but remained in schools where students underwent desegregation. Teachers who were transferred into those schools did not encounter the problem with supplies. Apparently, there were efforts to ease the transfer process as much as possible, perhaps at the expense of teachers who were not transferred.

About 7 percent of the teachers indicated that student transportation had created problems. As might be expected, the student transportation was a greater problem in schools where student shift was the greatest.

Fifty percent of the teachers indicated a need for additional student programs. While we might have expected teachers in schools where the students were desegregated to feel a greater need for special student programs, we did not find any relationship to such shifts.

The appropriateness of published texts and materials, however, was related to the desegregation process. Generally, 16 percent of the teachers believed that published text and materials were inappropriate for their student populations. This was especially true in schools which had traditionally been heavily Black in the student ethnic proportion.

Good parental support was noted by 75 percent of the teachers. There was an indication, however, that parental support was relatively higher than before in schools which until desegregation had been heavily Black in ethnicity. Schools where transportation was afforded through busing and which had been "other" prior to desegregation were especially the schools where parental support was relatively lower than before.

Teachers felt the need for additional information regarding their students. About 45 percent of the teachers requested additional information regarding their students. The insufficiencies of student data were especially noted in teachers who experienced desegregation shift--particularly if the teachers were placed in schools which were simultaneously experiencing student desegregation. The problem was most severe in schools which were heavily Black prior to desegregation.

The Degree of Personal and Property Security Experienced by Teachers Under Varying Desegregation Conditions

Security for materials and supplies and personal safety are not significant problems to most of the teachers in Dade County. Approximately 15 percent indicate that they were worried and would like greater security in these areas, but the same percentage of teachers feel that there is already too much security in these areas. Those who felt the least secure were the teachers who were transferred, in particular, those teachers transferred into schools which had been heavily Black prior to desegregation.

How Programs and Classroom Procedures Varied with Different Desegregation Conditions

Nearly one-half of the Dade County teachers provided instruction to different proportions of student ethnicity than they had in the previous year. Of this 50 percent, approximately one-half the teachers indicated a change in their teaching style in order to account for differences in their student populations. The changes were related to the amounts of teacher and student shift, suggesting an important consequence of desegregation. The greatest changes were due to increased levels of Black students in the classroom ethnic compositions with 33 percent of the Dade teachers indicating a greater proportion of such students among their classroom populations.

The use of individualized and linguistic reading programs were the major changes in instructional methods used by the teachers.

While these reading approaches changed, patterns of student and teacher allocations did not. Eighty percent of Dade classrooms are of the permanent traditional nature and are taught by one teacher located in the classroom. The other 20 percent of the rooms are of the open-space nature and are taught by a team of teachers or a teacher with an aide. These patterns were unrelated to desegregation shifts in either teachers or students.

Classrooms may contain students of such divergent skill levels that a non-graded basis is used. Approximately one-third of the Dade classrooms are of this nature, but again this strategy was not related to desegregation. Student seating can be established in the formal traditional rows and columns of desks or can range to total informality of placement of desks. In Dade County, approximately one-third are of the traditional formal arrangement, but such seating arrangements were not related to desegregation conditions.

In general, instructional procedures appear to have altered as a consequence of desegregation and the ethnic composition changes, but general program strategies have not changed.

Teacher Morale for Varying Conditions of Desegregation

The general level of teacher morale in Dade County was high. Five out of every six teachers in the county rated their teaching situation as average to excellent. About 33 percent of them have children of their own in Dade schools. Eighty percent of them perceive good parental support of the schools, high student morale, and pupils' enjoyment of the particular subject they teach.

While teacher morale in general is good, our conclusions regarding the morale of teachers directly affected by desegregation are more guarded. On the positive side, there was no relationship between shifts in students or teachers and a teacher's readiness to indicate good parental support, good student morale, and pupils' enjoyment of subjects taught suggesting no strong impact of the desegregation process upon teaching morale. The fact that few teachers were making plans to discontinue teaching because of desegregation is also suggestive of a minimal relationship between morale and desegregation. So too was the finding that work habits did not appear to suffer in teachers transferred for desegregation purposes. The Division of Finance cooperated with us to compare the sick leave rates for these transferred teachers to the rates for teachers drawn at random. The rates for transferred teachers were, if anything, less pronounced than their random counterparts.

Although these findings suggest no decrement in teacher morale as a consequence of desegregation, other results are not as encouraging. We have mentioned that principals of student desegregated schools indicated a significant initial teacher morale problem. The teacher's rating of dissatisfaction with her teaching situation was associated with student and teacher shift to a degree, although the relationship was statistically small.

It appears that a definitive statement regarding teacher morale and desegregation cannot, therefore, be made at this time. It is not unreasonable to suppose that morale is affected when teachers and students are moved about, but that morale is reestablished when stabilization occurs. Since the desegregation process will not require continuous movement of teachers and students to new locals, morale in a desegregated system would not be expected to suffer permanently.

The Extent to Which Busing Has Increased Due to Desegregation

Figure 18 is a chart extracted from a Dade County publication.[1] The figure indicates progressive school enrollments and the percentage of students transported for six successive years. The 1970-71 school year is the one in which desegregation transportation increases are reflected. Prior to that year increases in the student population transported were due to changes in the travel distance regulations for student access to the buses. Therefore, the increase between 1969-70 and 1970-71 of 2.0 percent can largely be attributed to desegregation requirements.

The principals of the student desegregated schools indicated a broad range of student busing for desegregation purposes. Thirty-five of the 70 principals stated that no students were bused for desegregation purposes, while another principal noted that 800 students in his school were transported. The average number of students bused per school was 104. The average percent of student body bused per school was 10.97 percent.

The Relationship of Busing and School Logistics

To most teachers, student transportation did not represent a source of difficulty. Only 6.5 percent of the teachers indicated that student transportation was a frequent or constant problem to them. Where there were problems, they usually occurred in schools where teachers experienced many other problems as well, such as: difficulties in obtaining supplies and materials, relating to the new school administration, and finding suitable texts for the students taught. Schools most affected by transportation problems were at the secondary level, ones in which student desegregation took place, and ones which had been heavily "other" in composition prior to desegregation.

The Effect of Busing on Student Participation in Before-and-After School Activities

Twenty-five of the 70 principals at school most affected by student desegregation indicated that busing interfered with the before-and-after

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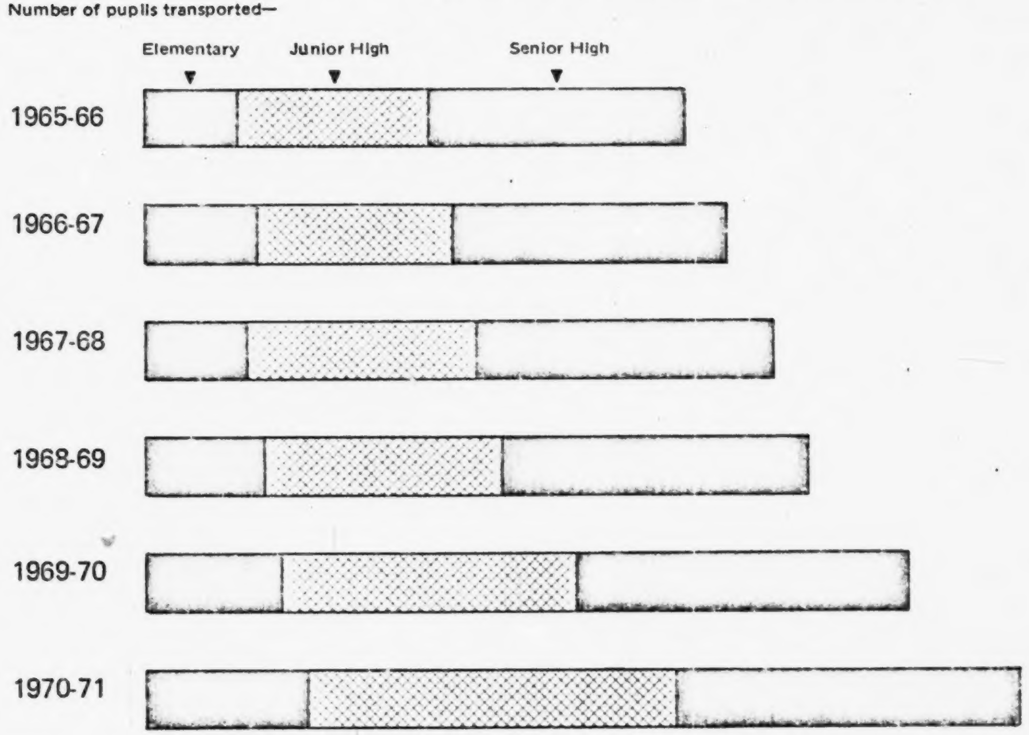
[1] Dade County Public School publication, Superintendent's 18th Annual Statistical Report, School Year 1970-71, Vol. 15, No. 7, p. 15.

FIGURE 18

A COMPARISON OF ENROLLMENT AND BUSSING INCREASES DURING THE DESEGREGATION PERIOD*



	Total Enrolled	Trans-ported	% of Total
1965-66	200,769	21,302	10.6
1966-67	208,305	22,894	11.0
1967-68	216,176	24,922	11.5
1968-69	230,586	26,262	11.4
1969-70	240,100	30,146	12.6
1970-71	236,929	34,512	14.6

*Extracted from: Department of Administrative Research, Dade County Public Schools, Superintendent's 18th Annual Statistical Report School Year 1970-71, Vol. XV, No. 7, p. 15.

school programs. There was some indication that this problem was more significant at the junior high school level than at either elementary or senior high schools.

The Relationship Between Busing and School Attendance

It has been noted before that schools which have the largest amount of busing often have the poorest school attendance, and the fear has been raised that increased busing will lead to increased student absenteeism. Our data do not support this conjecture. We were unable to find any relationship between increased busing and increased absenteeism.

The Relationship Between Busing and Expected Student Membership

Parental concern about student busing was expected to result in fewer students appearing at their assigned schools in the cases where busing was to be increased. Our results, however, indicate that increased busing was not related to a loss of students. Rather, the student membership was beneath expectations in the schools which had experienced the greatest number of vandalism cases and where student and teacher morale were lowest, suggesting that a school's reputation is the most likely instigator of reduced membership.

School Policies, Programs, and Features Which Relate to Successful Student Desegregation

Principals in the student desegregated schools found parent-teacher involvement and student involvement the most effective long-range strategies they used to prevent racial disorder. This approach was favored over the use of a human relations team, use of the guidance services, teacher human relations workshops, individual work with students and/or teachers, and several other approaches tried. Long-range strategies were much preferred to short ones as evident in an inability on the part of principals to identify any consistently good short-range step to take when racial conflict breaks out. A letter or telephone call to parents when a whole school problem was imminent was the much preferred method of communicating with them, and was seen as much more effective than conferences, assemblies, home visits by a visiting teacher, or the use of the PTA.

Human relations programs included training programs for teachers and principals and a human relations team which entered the school to help principals with their desegregation problems. We did not find evidence that the human relations training or workshops related to successful desegregation. The human relations team, however, was a successful adjunct to the desegregation process. Although this approach was used sparingly, the principals who employed the team found it useful in promoting interracial understanding between the teachers and the students. In the schools where the team was used, student morale was higher. These were also the schools, however, that had comparatively less shift in teacher and student assignments.

Thirty-two of the 70 principals indicated that instructional materials were not appropriate for the levels provided in their schools. Nineteen of the principals suggested a strong need for high-interest low-level materials in order to make desegregation more effective.

We were unable to find any relationship between general administrative strategies, school policies or programs which related to success in student desegregation. The general high morale of principals, teachers, and students which has remained through the desegregation process attests to the success which the principals have been able to engender. Apparently, successful policies and programs are schools specific, i.e., successful strategies in one location would have been failing strategies in another. By adapting strategies to the idiosyncratic needs of the school, desegregation was achieved.

The Relationship Between Desegregation and Student Transiency

We compared changes in the ethnic composition of the student populations of schools prior to and after desegregation with the transiency rates for the same time periods. Changes in a school's transiency level from one year to the next were related to shifts in both the student and teacher populations. The major effect of these changes were in the schools which prior to desegregation had been largely Black in ethnicity. In those schools, transiency rates increased proportionately greater than they did in other schools.

The Relationship Between Desegregation and Student Attendance

Attendance rates for the school years 1969-70 and 1970-71 were compared to changes in the student ethnicity. Changes in the attendance rates over the two-year period were unrelated to both student and teacher shifts.

The Relationship Between Desegregation and Deviant Student Behavior

Principals have indicated that an average of 3.4 percent of the student body in schools which were student desegregated were very disruptive. About one-half of the principals indicated that between 0 and 1 percent of their students were in this category, but two principals indicated that 25 percent of their student body fell into the category. The principals suggested, further, that an average of 7.5 percent of their pupils fell into the moderately disruptive category. An average of 13.2 percent of the student bodies were suggested as mildly disruptive. The largest percentage of disruptive students were said to be in the schools which increased their student Black ethnicity. A peculiar but persistent finding was that the greatest proportion of disruptive students occurred in schools which underwent the least amount of teacher shift. Where teacher shift was at its greatest, and especially in the schools that were heavily Black before desegregation, the smallest proportions of disruptive student behavior were noted.

Most principals indicated that between 0 and 5 percent of their behavior problems in the schools were racial in origin. This small percentage is confirmed by a decisive reduction in suspensions or expulsions meted on the basis of racial disturbances. It is also confirmed by a relative lack of racial overtones in vandalism instances. In the schools which experienced student desegregation, an average of 11 vandalism instances per school was recorded. Only 5 percent of those instances were thought by the principals to be racial in origin. Both behavior problems racial in origin and vandalism instances thought to be racial in origin were only slightly related to shifts in the student population, i.e., desegregation. Where they were related, the relationship was usually found in schools which had been heavily "other" prior to desegregation.

A study was made within classrooms of the amount of time students were attending to their assigned tasks. The amount of time the pupils were off task was totally unrelated to desegregation conditions of either shifts in the students or shifts in the teachers.

The Relationship Between Desegregation and Student Morale

An instrument which measures student attitudes toward school was administered too approximately 10,000 Dade pupils in grades four and above. The general finding was that schools heavily Black in their ethnic student population had poorer student morale than other schools. The morale scores, however, were unrelated to desegregation conditions in that shifts in students or teachers did not correlate with scores on the instrument.

Comments

School, principal, teacher, and student data are highly suggestive of a desegregation process still in transition. Isolated instances of student disruptive behavior have occurred and have certainly risen out of the desegregation process. At the same time, there is no general relationship between instances of such behavior and desegregation. Teachers have found their situation confused and challenging, but amounts of desegregation do not appear to relate to these difficulties. Principals have encountered problems which are novel to them, but all available evidence points to their finding individual solutions which stabilize the divergent roles in their individual schools.

APPENDIX A

METHODOLOGY

METHODOLOGY

The Variables

In the achievement section, the classical statistical paradigm with variable classifications was followed. According to this paradigm, variables are separated into dependent, controlled, and independent. Operationally, a controlled variable may be defined by one of two procedures: physical control, or blocking as it is often termed, and statistical control. Statistical control in the present analysis is achieved through multiple regression techniques.

Dependent Variables

The dependent variables are the reading and arithmetic subtests (typically Paragraph Meaning and Arithmetic Computation) of the Stanford Achievement Battery. These two subtests are administered to all students in grades 1-12 in May of each year in the countywide testing program. Scores from both the 1970 and 1971 May administration are available for approximately 80 percent of the 1970-71 second through twelfth graders. First graders have scores from the 1971 administration only.

The Stanford Achievement Battery, as was noted in the 1970-71 county achievement report (page nine) is a "good but aging test." It has acceptable reliability for group administrations and reasonally well reflects progress in the acquisition of mathematics and reading skills. Several limitations of the battery, or any other comparable battery, should be noted however.

First, it is a group test and is a reasonable index of level of skill development for groups. For individuals or even small numbers of persons, say less than 20 or so, the scores may be somewhat unstable. For this reason in some portions of the report scores are not reported for groups which have few members.

Second, the test scores are no more valid than the standardization of the conditions under which the testing occurred. Given the number of pupils tested and the number of locations involved in the testing, we cannot be absolutely sure in all cases the testing conditions were equivalent. We have, however, exercised as much control as possible. Scores for all students in one school were discarded from the analysis because of questions concerning the testing conditions.

Fourth, student motivation is a critical factor in the interpretation of the test results. An occasional student will simply not attempt to perform well on the test. Procedures have been used to select out the most obvious cases of this type. Certain inaccuracies, however, are sure to remain.

Finally, the SAT subtests do not discriminate well at the extreme score levels of any grade distribution. This occurs partially because of the floor and ceiling effects of age-grading the various levels of the battery. At the extremes of the score range for any grade level, the grade equivalent scores have a degree of precision that is more apparent than real, and should not be literally interpreted. This is particularly true for the higher grade levels where the grade-equivalent score range is large.

For some analyses scores are reported in standard grade equivalent terms. Other scores appear in modified form, but still in grade equivalent units.

As a students mature and develop skills at different rates, it is at times more meaningful to use scores representing the gain in proficiency from one time to another than to use scores representing only the final level of proficiency. This is particularly true when one wishes to compare final levels of performance and cannot be sure that the intial levels of performance for the various groups were similar. Two types of change scores, termed adjusted scores, are used in the present analysis. The first of these is the actual minus predicted score; this score along with the unadjusted grade equivalent scores are used in the graphical portions of the presentation. The second type of modified score is used only in the statistical portions of the analysis; these scores are produced by a technique known as partial regression analysis. Brief discussions of the methods used in computing each of these two types of modified scores follows in the paragraphs below. In either of the above procedures, the 1970 achievement scores are used as control variables.

For each pupil on each of the SAT subtests, the actual minus predicted score was produced by the following procedures:

1. Using the formula below compute the student's predicted 1971 SAT subtest (AC or PM) score, Y . . .

   $Y = 1.0 + b\ (71\ GL = .8) - b$

   where

   $$b = \frac{70CE - 1.0}{(70GL + .9) - 1.0}$$

   and where 70GE is the student's 1970 grade-equivalent score on the 1970 SAT administration;

   and where 70GL and 71GL are the numerical values of the student's grade level for the 1969-70 and 1970-71 school years, respectively.

2. From the student's actual 1971 SAT subtest score subtract his predicted 71 score, Y. The result is the student's difference score. Difference scores may be averaged to produce means for any sampling unit, such as classes, schools or ethnic groups. Note that these differences scores are not the type (posttest minus pretest) criticized in the gain score literature (Harris, 1963). Students scoring above, or below, grade level on the 1970 SAT administration have predicted 1971 scores that are above, or below, their 1971 grade level.

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[1] _Problems in Measuring Change_, C. Harris; University of Wisconsin Press, 1963, Madison, Wisconsin.

> The actual minus predicted value represents, in deviation grade-equivalent-norm units, the extent to which the student's 1971 test performance was above or below the prediction based on the 1970 test performance.

As noted above the actual minus predicted score differences are computed on the basis of the individual's past performance. The adjusted scores produced by the partial regression analysis are adjusted on the basis of a group's past performance. Both the actual minus predicted and regression techniques assume that the relationship between past and present performance is linear. Conceptually, the partial regression analyses involve the "correcting" of the effects of prior performance upon present performance. These adjusted scores are then analyzed with respect to a third variable, for instance the desegregation rank of the school the pupils attend.

These two adjustment procedures will not necessarily produce the same results. Further, the regression analysis is considerably more complex than is indicated in the previous paragraph. A more detailed explanation of this procedure is presented in Draper and Smith (1966).

Both arithmetic and reading scores are used in selected sections of the analysis. Due, however, to the number of pupils, ethnic groups, grades, and desegregation ranks involved in the analysis, the arithmetic test results will occasionally not be reported in the analysis because of space and cost considerations. Where it is found that the two skill areas are differentially affected by desegregation, it will be so noted in the discussion.

The Independent Variables

The independent variables, that is those variables which are thought or known to affect achievement are for this report grade, ethnicity, the pupil's quartile achievement level, and the desegregation rank of the pupil's 1969-70 and 1970-71 schools. In one or another sense, all of these variables except desegregation rank are control or blocking variables. Typically, the various achievement comparisons will occur within rather than across the levels of these variables. For instance, the 1971 achievement of seventh grade Black students in the first quarter of achievement in 1970 will be compared to that of their grade cohorts in the fourth quarter, and the comparisons will occur across the various levels of school desegregation.

As mentioned earlier, the pupil's performance on the 1970 achievement test will be used to adjust his 1971 performance scores. In this case, the 1970 achievement scores are used as controlled variables. In other cases, the 1970 scores are compared with the 1971 scores directly by means of difference (71-70) scores, and these scores are related to desegregation indices.

The desegregation rank of the schools in 1969-70 and 1970-71 are the major independent variables. The percentage of the student body that is Black corresponds to the desegregation ranks as indicated in Table 11 below. The percentage values of the ranks are the same for both school years. It will be noted that with the exception of the two extreme ranks, an increase of one rank unit corresponds to an average increase of 10 percent Black.

TABLE 11

SCHOOL DESEGREGATION RANK AND CORRESPONDING PERCENT BLACK

Rank Number	0	1	2	3	4	5	6	7	8	9	10	11
Percent Black in School	0.9 to 0.99	1.0 to 8.99	10.0 to 19.99	20.0 to 29.99	30.0 to 39.99	40.0 to 49.99	50.0 tto 59.99	60.0 to 69.99	70.0 to 79.99	80.0 to 89.99	90.0 to 99.99	100.0
Effective Mid Point	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	95.0	100.0

It should be noted that there is no necessary correspondence between the percentage Black in school and the percentage Black in classes within that school. Several writers on the effects of desegregation have noted that the appropriate analytic unit is the percent Black in class rather than that in school. Weinberg (1970) cites research indicating that attending racially homogeneous classes in racially heterogeneous schools may be detrimental to the academic performance of Blacks. Due to the number of students in classes involved in the present analysis, class desegregation ranks could not be used. A sizable random sample of elementary and junior high classes was selected in order to investigate the degree of correspondence between school and class desegregation. At these school levels the sample indicates that there is no consistent bias in the extent to which class desegregation ranks correspond to the school desegregation ranks.

Other research (Coleman, 1966) has indicated that, at the senior high level, school and class desegregation ranks are not coincidental. This phenomenon occurs primarily by virtue of the subject-specific nature of the high school curriculum. There are, for instance, proportionately fewer Black students in advanced science and mathematics courses, and proportionately more Black students in technical and vocational courses. Such selections occur primarily on the basis of past academic performance and student interest. The meaning, then, of desegregation rank is not consistent between the primary and junior high levels and the senior high level. For this reason, and because the 1970 pupil desegregation court orders did not extend to the high schools, we have included less achievement information for the high schools than for the earlier school levels.

Statistics Employed

Correlation statistics are the primary analytic indices used in this study. Correlation coefficients range in magnitude from minus one to plus one. If the magnitude of the coefficient is close to zero, it indicates that there is little or no relationship between the two attributes. As the size of the coefficient approaches either plus or minus one, it indicates progressively stronger degrees of relationship. At plus and minus one the degree of association is perfect. The sign of the coefficient indicates the direction of the relationship. A positive coefficient indicates that an increase in one attribute is associated with an increase in the other attribute. Most often correlation coefficients are used as indices of the linear association between two attributes. A linear association is one in which a per unit change on one attribute is associated with a constant rate/of change on the other attribute. The reader is referred to standard statistical tests for further details.

APPENDIX B

MATRICES OF REGRESSION COEFFICIENTS

MATRIX 1

RANKS ARE BLACK, 1970 AC BLACK GRADE 7
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	1.6500 0.2121 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.5000 0.0 1.	0.0 0.0 0.	1.7000 0.0 1.	3.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	2.1000 0.8485 2.	1.7447 0.4261 38.	1.5222 0.3962 9.	1.6200 0.2950 5.	1.5667 0.4163 3.	1.8556 0.5270 9.	1.6000 0.6964 5.	0.0 0.0 0.	1.6500 0.0707 2.	1.5000 0.2828 2.	1.1000 0.0 1.	0.0 0.0 0.
2	0.0 0.0 0.	1.6706 0.2339 17.	1.4853 0.3509 34.	1.7857 0.5406 21.	0.0 0.0 0.	0.0 0.0 0.	1.5000 0.3272 18.	1.4125 0.1808 8.	1.5556 0.2603 9.	0.0 0.0 0.	2.1000 0.0 1.	1.2000 0.0 1.
3	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.6333 0.4165 42.	0.0 0.0 0.	1.7677 0.5969 31.	1.2636 0.2580 11.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.6000 0.0 1.	1.4000 0.3464 3.
4	0.0 0.0 0.	0.0 0.0 0.	1.0000 0.0 1.	0.0 0.0 0.	2.0000 0.5341 19.	1.6565 0.4731 46.	0.0 0.0 0.	0.0 0.0 0.	1.8000 0.0 1.	1.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	2.4500 0.9192 2.	2.5000 0.0 1.	0.0 0.0 0.	1.8621 0.9073 29.	2.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	1.8333 0.4381 24.	1.9000 0.0 1.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	1.5000 0.5657 2.	1.9000 0.0 1.	1.7667 0.1528 3.	2.2000 0.0 1.	1.6263 0.4293 19.	1.6778 0.4191 27.	1.6703 0.5154 64.	1.6500 0.5000 4.	0.0 0.0 0.	1.7000 0.0 1.	2.2000 0.0 1.
8	0.0 0.0 0.	1.7000 0.0 1.	1.6437 0.4366 16.	1.6538 0.2757 13.	1.5733 0.2994 30.	0.0 0.0 0.	1.5000 0.4243 2.	0.0 0.0 0.	1.6500 0.0707 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	1.3000 0.0 1.	1.6500 0.0707 2.	2.2000 0.0 1.	1.3299 0.3454 87.	1.4800 0.4087 5.	0.0 0.0 0.	1.2000 0.0 1.	0.0 0.0 0.	1.2000 0.1414 2.	0.0 0.0 0.
10	1.2000 0.0 1.	1.4500 0.6364 2.	1.7800 0.8758 5.	1.6385 0.3280 13.	1.5545 0.3310 55.	1.6954 0.5424 199.	1.5940 0.4935 234.	1.5278 0.4064 212.	1.7404 0.3791 109.	2.0503 0.7306 163.	1.4742 0.3429 221.	1.4403 0.3622 154.
11	1.9600 1.1480 5.	1.4545 0.2734 11.	1.6286 0.1496 7.	1.4467 0.2752 45.	1.5727 0.4526 121.	1.6762 0.5839 101.	1.6524 0.4058 168.	1.6644 0.3486 101.	1.4414 0.3944 232.	1.4385 0.2364 13.	1.5813 0.4212 300.	1.4057 0.3371 228.

MATRIX 2

RANKS ARE BLACK, 1970 AC OTHER GRADE 2
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	2.2259 0.6423 3790.	2.0811 0.6034 564.	2.3349 0.6318 139.	2.1000 0.5268 25.	2.0535 0.6614 185.	2.0107 0.5679 112.	2.2806 0.6332 31.	2.0150 0.4722 40.	2.6717 1.0210 46.	1.6667 0.3215 3.	2.1333 0.4619 3.	0.0 0.0 0.
1	2.2140 0.7008 298.	2.0783 0.5959 568.	2.0266 0.5997 79.	2.0889 0.1764 9.	2.2684 0.6380 117.	2.0989 0.5790 95.	2.2640 0.5719 84.	1.9000 0.2915 5.	0.0 0.0 0.	1.9643 0.5444 14.	0.0 0.0 0.	0.0 0.0 0.
2	2.1909 0.5923 33.	2.0784 0.5850 125.	2.0309 0.5051 81.	2.1795 0.6777 88.	1.9000 0.4243 2.	1.3000 0.2828 2.	1.8244 0.4482 41.	1.7600 0.4882 30.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
3	2.0286 0.6047 7.	2.2000 0.0 1.	1.6500 0.0707 2.	2.0171 0.7123 82.	2.2000 0.7024 4.	1.6217 0.5494 23.	1.2429 0.1902 7.	1.1000 0.0 1.	1.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	1.8333 0.8737 3.	1.7333 0.1528 3.	2.1000 0.0 1.	0.0 0.0 0.	2.2000 0.8425 38.	1.9448 0.4740 58.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	4.9000 0.0 1.	1.9000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	1.8000 0.0 1.	0.0 0.0 0.	1.9625 0.5345 8.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.8000 0.7071 2.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	2.5333 0.5508 3.	3.0000 0.0 2.	0.0 0.0 0.	1.7000 0.0 1.	1.3000 0.0 1.	1.9000 0.4375 8.	2.4182 0.6096 11.	1.8143 0.4776 7.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	1.6500 0.2121 2.	0.0 0.0 0.	2.1000 0.0 1.	0.0 0.0 0.	2.0000 0.4891 27.	1.6000 0.0 1.	0.0 0.0 0.	1.8000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	1.3000 0.0 1.	0.0 0.0 0.	2.2000 0.0 1.	0.0 0.0 0.	3.1000 0.0 1.	1.3250 0.1258 4.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	1.4500 0.2121 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	2.3000 0.0 1.	1.7667 0.7024 3.	2.1000 1.0456 4.	0.0 0.0 0.	2.4000 0.0 1.	2.6000 1.1045 5.	0.0 0.0 0.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

MATRIX 3

RANKS ARE BLACK, 1970 AE SPANISH GRADE 2

COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	1.9796 0.4940 1249.	2.0291 0.5264 134.	2.2144 0.5923 27.	2.0067 0.4803 15.	1.7872 0.3955 39.	1.8972 0.5066 72.	2.2308 0.6031 13.	1.6214 0.5013 14.	2.2062 0.4090 16.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	2.0559 0.4967 238.	1.9267 0.4637 131.	1.8187 0.3233 16.	1.7647 0.2763 69.	1.9429 0.5381 7.	1.9082 0.6579 97.	1.8389 0.5282 18.	1.6400 0.2408 5.	2.0600 0.5320 5.	3.3000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
2	1.9333 0.6125 12.	1.6250 0.4200 8.	1.7566 0.4574 53.	1.7800 0.6615 10.	1.5000 0.0 1.	1.5667 0.3215 3.	1.6105 0.3928 19.	1.6556 0.3087 9.	1.6111 0.2261 9.	1.7000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
3	1.8000 0.4583 3.	1.7000 0.0 1.	2.4000 0.0 1.	1.5995 0.4218 21.	1.1600 0.0 1.	1.6698 0.4911 43.	1.3565 0.4077 23.	1.7000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	2.5000 0.5657 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.8455 0.4741 11.	1.6400 0.3334 15.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
5	2.1000 0.4359 3.	1.8000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	2.5000 0.0 1.	1.7199 0.4905 21.	0.0 0.0 0.	1.2000 0.0 1.	0.0 0.0 0.	1.7500 0.4231 6.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	1.7000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.6909 0.2809 11.	1.6000 0.0 1.	1.6545 0.3236 11.	1.9000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.2000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	1.7500 0.2121 2.	0.0 0.0 0.	0.0 0.0 0.	1.2667 0.2887 3.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	0.0 0.0 0.	1.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.5000 0.0 1.	1.7375 0.9618 8.	1.6000 0.0 1.	1.5000 0.0 1.	1.5000 0.0 1.	1.5000 0.2828 2.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

MATRIX 4

RANKS ARE BLACK, - 1971 PM BLACK GRADE 2
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	1.6000 0.0 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.6000 0.0 1.	0.0 0.0 0.	1.5000 0.0 1.	4.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	1.5500 0.4950 2.	1.7447 0.4507 39.	1.4556 0.2603 9.	1.5400 0.3715 5.	1.4333 0.3786 3.	1.6556 0.4640 9.	1.5600 0.3715 5.	0.0 0.0 0.	1.7000 0.1414 2.	1.4000 0.2828 2.	1.4000 0.0 1.	0.0 0.0 0.
2	0.0 0.0 0.	1.5294 0.2616 17.	1.6794 0.4291 34.	2.0524 0.9346 21.	0.0 0.0 0.	0.0 0.0 0.	1.5556 0.2874 18.	1.5625 0.2066 8.	1.5111 0.2421 9.	0.0 0.0 0.	1.6000 0.0 1.	1.5000 0.0 1.
3	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.6786 0.4159 42.	0.0 0.0 0.	1.8742 0.8278 31.	1.5545 0.3588 11.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.6000 0.0 1.	1.2667 0.2082 3.
4	0.0 0.0 0.	0.0 0.0 0.	1.4000 0.0 1.	0.0 0.0 0.	2.0526 0.6720 19.	1.5087 0.2374 46.	0.0 0.0 0.	0.0 0.0 0.	1.7000 0.0 1.	1.8000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.9000 0.4243 2.	1.6000 0.0 1.	0.0 0.0 0.	1.6414 0.4954 29.	1.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	1.6875 0.3314 24.	1.5000 0.0 1.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	1.8500 0.3536 2.	1.5000 0.0 1.	2.3667 0.5132 3.	2.7000 0.0 1.	1.4737 0.2884 19.	1.5148 0.3047 27.	1.4750 0.3523 64.	1.7000 0.8485 4.	0.0 0.0 0.	1.0000 0.0 1.	1.6000 0.0 1.
8	0.0 0.0 0.	1.6000 0.0 1.	1.5912 0.3103 16.	1.6769 0.4226 13.	1.6333 0.3177 30.	0.0 0.0 0.	1.6000 0.1414 2.	0.0 0.0 0.	1.6500 0.0707 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	1.9000 0.0 1.	1.6000 0.0 2.	1.6000 0.0 1.	1.4609 0.3127 87.	1.6800 0.4604 5.	0.0 0.0 0.	1.5000 0.0 1.	0.0 0.0 0.	1.3500 0.2121 2.	0.0 0.0 0.
10	1.7000 0.0 1.	1.3000 0.2829 2.	1.6400 0.6656 5.	1.5000 0.3764 13.	1.4454 0.2714 55.	1.4990 0.4149 199.	1.6163 0.4203 294.	1.5335 0.3708 212.	1.5706 0.4816 109.	2.0043 0.8712 163.	1.4470 0.3130 221.	1.4390 0.2893 154.
11	2.1800 0.9258 5.	1.5545 0.2659 11.	1.6629 0.1134 7.	1.5133 0.2409 45.	1.6173 0.5419 121.	1.7149 0.6295 101.	1.6839 0.3650 168.	1.6386 0.3364 101.	1.5090 0.3204 232.	1.4692 0.2689 13.	1.5520 0.3861 300.	1.6351 0.3491 228.

MATRIX 5

RANKS ARE BLACK, 1970 PM OTHER GRADE 2

COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	2.0277 0.6912 3790.	1.8499 0.6178 564.	2.1309 0.6784 139.	1.8980 0.8550 25.	1.8762 0.5584 185.	1.7946 0.6615 112.	2.0194 0.6645 31.	1.8500 0.6637 40.	2.4000 0.9897 46.	1.3667 0.2887 3.	1.5667 0.1155 3.	0.0 0.0 0.
1	2.0751 0.9213 298.	1.9830 0.6539 568.	1.6671 0.4961 79.	1.7778 0.6924 9.	2.0239 0.5871 117.	1.8695 0.5294 95.	2.0488 0.5894 84.	1.5800 0.2387 5.	0.0 0.0 0.	1.9071 0.5121 14.	0.0 0.0 0.	0.0 0.0 0.
2	1.9333 0.5103 33.	1.8976 0.5644 125.	1.8543 0.5015 81.	2.1329 0.7849 88.	1.8500 0.3536 2.	1.7500 0.0707 2.	1.5927 0.3150 41.	1.5833 0.2520 30.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
3	1.9429 1.2026 7.	2.4000 0.0 1.	1.4000 0.2828 2.	2.0415 0.7575 82.	2.1500 0.9037 4.	1.7087 0.7379 23.	1.5429 0.3359 7.	1.4000 0.0 1.	1.4000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	1.5667 0.5508 3.	1.3000 0.2646 3.	2.1000 0.0 1.	0.0 0.0 0.	2.0210 0.8514 38.	1.5086 0.2830 58.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.2000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	4.1000 0.0 1.	1.7000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	1.2000 0.0 1.	0.0 0.0 0.	1.6125 0.1959 8.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.9000 0.5657 2.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	1.7333 0.1528 3.	3.1500 2.0506 2.	0.0 0.0 0.	1.6000 0.0 1.	1.7000 0.0 1.	1.5750 0.3536 8.	2.5818 1.0245 11.	1.4714 0.3638 7.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	1.5500 0.0707 2.	0.0 0.0 0.	4.6000 0.0 1.	0.0 0.0 0.	2.0074 0.6906 27.	1.0000 0.0 1.	0.0 0.0 0.	1.7000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	1.4000 0.0 1.	0.0 0.0 0.	1.7000 0.0 1.	0.0 0.0 0.	2.3000 0.0 1.	1.4750 0.1893 4.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	1.5500 0.2121 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.8000 0.0 1.	1.5667 0.1155 3.	1.6500 0.0577 4.	0.0 0.0 0.	1.7000 0.0 1.	2.3600 1.2720 5.	0.0 0.0 0.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

MATRIX 6

RANKS ARE BLACK, 1970 PM SPANISH GRADE 2
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	1.6838 0.4302 1249.	1.7351 0.5502 134.	1.8296 0.5869 27.	1.6600 0.3795 15.	1.6333 0.3274 39.	1.6514 0.4603 72.	1.7385 0.2987 13.	1.6929 0.4953 14.	1.8875 0.3202 16.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	1.9008 0.4234 238.	1.6985 0.3584 131.	1.3937 0.2516 16.	1.5559 0.2530 68.	1.7143 0.5815 7.	1.4299 0.3352 97.	1.5111 0.3123 18.	1.5600 0.1517 5.	1.4800 0.1924 5.	4.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
2	1.8833 0.7791 12.	1.7625 0.2560 8.	1.6226 0.2367 53.	1.7000 0.4876 10.	1.5000 0.0 1.	1.5667 0.1155 3.	1.5210 0.3137 19.	1.5333 0.2345 9.	1.4000 0.2236 9.	1.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
3	1.6000 0.1000 3.	1.0000 0.0 1.	2.5000 0.0 1.	1.5909 0.3326 21.	1.6000 0.0 1.	1.8209 0.9628 43.	1.6000 0.4431 23.	1.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	1.7500 0.4950 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.4636 0.2618 11.	1.3867 0.2295 15.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
5	1.7333 0.0577 3.	1.4000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.9000 0.0 1.	1.5381 0.2674 21.	0.0 0.0 0.	1.2000 0.0 1.	0.0 0.0 0.	1.7000 0.4427 6.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	1.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.4182 0.2359 11.	1.4000 0.0 1.	1.2818 0.2442 11.	1.2000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	1.6000 0.0 2.	0.0 0.0 0.	0.0 0.0 0.	1.5333 0.1155 3.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	0.0 0.0 0.	1.0000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.1000 0.0 1.	1.3625 0.3204 8.	1.7000 0.0 1.	1.1000 0.0 1.	1.6000 0.0 1.	1.6500 0.7778 2.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

MATRIX 7

RANKS ARE BLACK. POST - PRE TEST PM BLACK GRADE 2
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	0.7000 0.2828 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	2.2000 0.0 1.	0.0 0.0 0.	0.2000 0.0 1.	-1.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	0.3500 1.5263 2.	0.6105 0.7365 38.	0.7111 0.5936 9.	0.5400 0.4775 5.	0.8667 0.4726 3.	0.5000 0.5608 9.	0.7400 0.9715 5.	0.0 0.0 0.	0:4500 0.3536 2.	0.6500 0.0707 2.	0.2000 0.0 1.	0.0 0.0 0.
2	0.0 0.0 0.	0.6235 0.6610 17.	0.6971 0.7255 34.	0.7143 0.5561 21.	0.0 0.0 0.	0.0 0.0 0.	0.5556 0.6930 18.	0.5750 0.4027 8.	0.6778 0.4842 9.	0.0 0.0 0.	0.3000 0.0 1.	0.6000 0.0 1.
3	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.7310 0.6154 42.	0.0 0.0 0.	0.4258 1.1027 31.	0.5818 0.4262 11.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.3000 0.0 1.	0.1667 0.1528 3.
4	0.0 0.0 0.	0.0 0.0 0.	0.3000 0.0 1.	0.0 0.0 0.	0.6789 0.5922 19.	0.8261 0.5899 46.	0.0 0.0 0.	0.0 0.0 0.	0.5000 0.0 1.	1.4000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.2500 0.3536 2.	-0.5000 0.0 1.	0.0 0.0 0.	0.3138 0.5774 29.	1.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.5792 0.5920 24.	1.9000 0.0 1.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	1.2500 0.6364 2.	0.8000 0.0 1.	1.3000 0.5548 3.	0.7000 0.0 1.	0.8105 0.4026 19.	0.4815 0.5182 27.	1.2594 0.8997 64.	0.8500 0.7000 4.	0.0 0.0 0.	0.8000 0.0 1.	0.5000 0.0 1.
8	0.0 0.0 0.	0.2000 0.0 1.	0.6875 0.6238 16.	0.5308 0.4404 13.	0.4733 0.4756 30.	0.0 0.0 0.	0.5500 0.4950 2.	0.0 0.0 0.	0.6500 0.0707 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	-0.7000 0.0 1.	0.0500 0.2121 2.	0.7000 0.0 1.	0.7471 0.6237 87.	0.5800 0.7910 5.	0.0 0.0 0.	0.4000 0.0 1.	0.0 0.0 0.	1.2000 1.5556 2.	0.0 0.0 0.
10	1.7000 0.0 1.	1.2000 0.7071 2.	0.9200 1.0663 5.	0.5692 0.4871 13.	0.6836 0.6118 55.	0.5643 0.5772 199.	0.3908 0.5814 294.	0.9250 0.6949 212.	0.5339 0.5063 109.	0.9350 1.0529 163.	0.7127 0.5215 221.	0.7506 0.5419 154.
11	0.8000 0.5892 5.	0.7182 0.6509 11.	0.7714 0.6550 7.	0.5956 0.5231 45.	0.5802 0.6639 121.	0.6198 0.7859 101.	0.5911 0.5893 168.	0.6594 0.5582 101.	0.7892 0.6626 232.	1.3154 0.9789 13.	0.7570 0.6333 300.	0.6719 0.5404 228.

MATRIX 8

RANKS ARE BLACK, POST - PRE TEST PM OTHER GRADE 2
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	1.1714 0.8056 3790.	1.1394 0.8709 564.	1.2316 0.7890 139.	0.8320 1.0082 25.	1.0232 0.7623 185.	0.9839 0.7495 112.	1.1000 0.9041 31.	1.1975 1.0836 40.	0.9196 0.9708 46.	1.6333 0.8327 3.	0.3667 0.2517 3.	0.0 0.0 0.
1	1.1154 0.9767 298.	0.9563 0.6992 568.	0.8152 0.5079 79.	1.3111 0.5600 9.	1.0376 0.6077 117.	0.9010 0.6789 95.	1.2702 0.7236 84.	0.7000 0.4123 5.	0.0 0.0 0.	1.6500 1.0420 14.	0.0 0.0 0.	0.0 0.0 0.
2	1.4061 0.7361 33.	1.1168 0.7554 125.	0.9914 0.7218 91.	1.2295 0.7903 88.	1.2000 0.4243 2.	0.8000 1.1314 2.	0.7634 0.6568 41.	0.8433 0.9295 30.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
3	0.9143 0.8275 7.	0.8000 0.0 1.	0.3500 0.4950 2.	1.1902 0.7677 82.	0.5000 0.5657 4.	0.4043 0.8788 23.	0.8429 0.8462 7.	0.2000 0.0 1.	0.4000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	1.5000 0.3464 3.	0.7000 0.4359 3.	1.3000 0.0 1.	0.0 0.0 0.	0.7684 0.6217 38.	1.2465 0.5535 58.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.9000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	1.1000 0.0 1.	0.7000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	1.0000 0.0 1.	0.0 0.0 0.	0.3875 0.4549 8.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.1000 0.5657 2.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.6980 1.1269 3.	0.8000 0.2828 2.	0.0 0.0 0.	1.3000 0.0 1.	0.1000 0.0 1.	1.0500 0.5264 8.	0.8727 0.9582 11.	1.5571 0.4392 7.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	1.1500 0.7778 2.	0.0 0.0 0.	0.6000 0.0 1.	0.0 0.0 0.	0.9296 0.9046 27.	0.6000 0.0 1.	0.0 0.0 0.	0.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	2.0000 0.0 1.	0.0 0.0 0.	0.4000 0.0 1.	0.0 0.0 0.	1.4000 0.0 1.	0.9500 0.4359 4.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	1.0500 0.3536 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.4000 0.0 1.	0.9000 0.7000 3.	0.1250 0.2630 4.	0.0 0.0 0.	1.2000 0.0 1.	0.9000 0.8426 5.	0.0 0.0 0.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

MATRIX 9

RANKS ARE BLACK, POST - PRE TEST PM SPANISH GRADE 2
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	0.2306 0.7495 1249.	0.7985 0.6307 134.	0.8926 0.5262 27.	0.4267 0.6273 15.	0.6077 0.5372 39.	0.7764 0.5875 72.	0.7769 0.6978 13.	0.5143 0.7725 14.	0.7000 0.6767 15.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	0.8176 0.7393 239.	0.9740 0.6156 131.	0.5687 0.4909 16.	0.6265 0.5199 68.	0.6000 0.2733 7.	0.5113 0.3926 97.	0.7222 0.4609 18.	0.6200 0.7587 5.	0.6400 0.7266 5.	3.3000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
2	1.1167 1.3604 12.	0.5000 0.5904 8.	0.7774 0.6113 53.	0.9800 0.5903 10.	0.6000 0.0 1.	0.9667 0.2517 3.	0.3947 0.4576 19.	0.6778 0.6534 9.	0.5222 0.6978 9.	1.[illegible]000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
3	1.3000 1.2299 3.	0.9000 0.0 1.	0.2000 0.0 1.	0.6238 0.7752 21.	0.6000 0.0 1.	0.2302 1.0373 43.	0.6304 0.6385 23.	1.3000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	0.3000 0.9899 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.8727 0.5641 11.	0.9467 0.4438 15.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
5	0.6667 0.5033 3.	0.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.2000 0.0 1.	0.4238 0.3223 21.	0.0 0.0 0.	1.7000 0.0 1.	0.0 0.0 0.	0.5833 0.7935 6.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	1.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.7455 0.4180 11.	0.7000 0.0 1.	1.2273 0.5350 11.	0.4000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.9000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	1.7000 1.4142 2.	0.0 0.0 0.	0.0 0.0 0.	0.4000 0.2646 3.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	0.0 0.0 0.	0.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.4000 0.0 1.	0.7250 0.4590 8.	0.6000 0.0 1.	1.6000 0.0 1.	0.5000 0.0 1.	0.6500 0.2121 2.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

MATRIX 10

RANKS ARE BLACK, ACTUAL - PREDICTED AC BLACK GRADE 7
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	1.3500 0.7778 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	2.1000 0.0 1.	0.0 0.0 0.	0.7000 0.0 1.	-1.0000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	0.3000 1.9395 2.	-0.1289 0.9752 38.	0.5222 1.2428 9.	0.2000 0.3162 5.	-0.5000 0.6000 3.	0.3556 1.1759 9.	0.1200 1.3400 5.	0.0 0.0 0.	0.8000 0.2828 2.	1.0500 0.4950 2.	0.1000 0.0 1.	0.0 0.0 0.
2	0.0 0.0 0.	0.2353 0.7666 17.	0.8029 1.0950 34.	-0.0095 1.0940 21.	0.0 0.0 0.	0.0 0.0 0.	0.2944 0.5641 18.	0.7750 0.5523 8.	0.5222 0.8570 9.	0.0 0.0 0.	0.5000 0.0 1.	1.1000 0.0 1.
3	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.6143 0.7257 42.	0.0 0.0 0.	0.7710 1.1736 31.	1.0909 0.9170 11.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.8000 0.0 1.	0.5667 0.2887 3.
4	0.0 0.0 0.	0.0 0.0 0.	0.3000 0.0 1.	0.0 0.0 0.	0.0421 0.9002 19.	0.3674 1.0144 46.	0.0 0.0 0.	0.0 0.0 0.	-0.3000 0.0 1.	0.8000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	-1.0000 1.5556 2.	-1.9000 0.0 1.	0.0 0.0 0.	0.0345 1.6496 29.	-0.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.5500 1.0430 24.	1.3000 0.0 1.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	0.0 0.5657 2.	1.2000 0.0 1.	0.4667 0.0577 3.	-0.2800 0.0 1.	0.4684 0.9719 19.	0.2000 0.6662 27.	0.6469 0.8679 64.	0.1000 1.1904 4.	0.0 0.0 0.	0.1000 0.0 1.	1.0000 0.0 1.
8	0.0 0.0 0.	-1.1000 0.0 1.	-0.2187 1.0319 16.	-0.4231 0.6002 13.	0.4533 0.7070 30.	0.0 0.0 0.	0.6500 1.4849 2.	0.0 0.0 0.	0.8500 0.6364 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	0.4000 0.0 1.	0.0500 0.3536 2.	0.0 0.0 1.	0.5448 0.6633 87.	1.4800 0.6419 5.	0.0 0.0 0.	0.1000 0.0 1.	0.0 0.0 0.	1.0000 1.2728 2.	0.0 0.0 0.
10	2.9000 0.0 1.	0.3000 1.6971 2.	-0.0800 1.3809 5.	-0.3462 0.7207 13.	0.3509 0.9156 55.	0.1467 0.9998 199.	0.1629 0.9149 294.	0.7849 0.8335 212.	0.0064 0.7771 109.	-0.2386 1.3576 163.	0.3294 0.8260 221.	0.8643 0.7525 154.
11	0.8200 0.3768 5.	0.6818 0.9506 11.	0.3143 1.1082 7.	0.0867 0.5829 45.	0.4149 0.7501 121.	0.4515 0.9641 101.	0.3583 0.8778 169.	0.3881 0.8920 101.	0.8103 0.8179 232.	0.9846 0.6039 13.	0.8657 0.8958 300.	0.8443 0.7338 228.

MATRIX 11

RANKS ARE BLACK, ACTUAL - PREDICTED AC OTHER GRADE 2

COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	-0.0960 1.1303 3790.	0.0191 1.0369 566.	-0.7043 1.2698 139.	-0.4960 0.9226 25.	-0.5508 1.1375 185.	0.1152 0.9955 112.	-0.3968 1.0410 31.	-0.0025 0.9784 40.	-0.8196 1.9536 46.	0.7667 1.4844 3.	-0.1000 0.9249 3.	0.0 0.0 0.
1	0.1139 1.0817 299.	-0.1840 1.0655 568.	0.0468 0.9495 79.	0.2333 0.6205 9.	-0.2632 0.9391 117.	0.0821 0.8926 55.	-0.3214 0.9721 84.	0.4200 0.9884 5.	0.0 0.0 0.	0.1214 0.9504 14.	0.0 0.0 0.	0.0 0.0 0.
2	0.1121 1.0490 33.	0.0360 1.0324 125.	0.1321 0.9722 81.	-0.5659 1.2415 83.	0.4000 0.1414 2.	0.6500 0.2121 2.	0.2000 0.7701 41.	0.5733 1.1329 30.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
3	0.0429 0.6729 7.	-0.3000 0.0 1.	0.7500 0.3536 2.	-0.0476 1.0853 82.	-0.4000 1.4445 4.	0.8565 0.9676 23.	1.0571 1.3636 7.	1.5000 0.0 1.	-0.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	-0.9333 1.0017 3.	-0.5667 0.6807 3.	-0.3000 0.0 1.	0.0 0.0 0.	-0.5763 1.1976 38.	0.2121 0.9238 58.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	-5.9000 0.0 1.	1.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	-1.1000 0.0 1.	0.0 0.0 0.	-0.5125 1.0162 8.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.0000 0.2828 2.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	-0.2000 0.9644 3.	-0.6500 1.3435 2.	0.0 0.0 0.	0.5000 0.0 1.	0.6000 0.0 1.	0.2125 0.8610 8.	-0.6636 1.0181 11.	0.2857 0.7647 7.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	0.6500 0.2121 2.	0.0 0.0 0.	1.0000 0.0 1.	0.0 0.0 0.	0.0481 1.0338 27.	-0.2000 0.0 1.	0.0 0.0 0.	0.2000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	1.5000 0.0 1.	0.0 0.0 0.	0.6000 0.0 1.	0.0 0.0 0.	-1.4000 0.0 1.	0.4000 0.2828 4.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	1.0000 0.7071 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	-0.2000 0.0 1.	0.0 1.4000 3.	-0.2000 1.8013 4.	0.0 0.0 0.	-0.8000 0.0 1.	-1.0400 2.4017 5.	0.0 0.0 0.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

MATRIX 12

RANKS ARE BLACK, ACTUAL - PREDICTED AC SPANISH GRADE 2

COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	0.2738 0.9615 1248.	-0.0276 0.9678 134.	-0.3074 1.1428 27.	-0.2400 0.9612 15.	0.3615 0.8729 39.	0.1431 0.8775 72.	-0.1231 1.0426 13.	0.3214 1.1969 14.	0.[illegible]75 0.9539 16.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	-0.0160 0.9842 238.	0.1740 0.8545 131.	-0.1000 0.8959 16.	-0.0015 0.7458 68.	-0.2429 0.9404 7.	-0.0227 0.9149 97.	0.5778 0.8489 18.	0.8800 0.7950 5.	0.2200 0.7294 5.	-1.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
2	0.2167 0.9360 12.	1.3625 0.8383 8.	0.3226 0.8787 53.	0.0800 1.1183 10.	-0.3000 0.0 1.	1.6667 0.7767 3.	0.2526 0.7693 19.	0.2556 0.4640 9.	0.5667 0.4610 9.	0.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
3	0.1667 0.5859 3.	0.1000 0.0 1.	-0.9000 0.0 1.	0.4391 0.8090 21.	1.7000 0.0 1.	0.5256 1.4712 43.	1.3565 0.9553 23.	0.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	0.6000 0.5657 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.1273 1.0631 11.	0.2933 0.7096 15.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
5	-0.8667 0.4726 3.	0.7000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	-0.8000 0.0 1.	0.1762 1.0305 21.	0.0 0.0 0.	0.8000 0.0 1.	0.0 0.0 0.	1.0333 0.8802 6.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	-0.3000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.4000 0.3573 11.	0.2000 0.0 1.	0.6545 0.9658 11.	0.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.4000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	0.3000 0.4243 2.	0.0 0.0 0.	0.0 0.0 0.	0.1333 0.4726 3.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	0.0 0.0 0.	-1.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.4000 0.0 1.	-0.1625 1.4010 8.	1.1000 0.0 1.	1.0000 0.0 1.	0.0 0.0 1.	0.1500 0.6364 2.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

MATRIX 13

RANKS ARE BLACK,   POST - PRE TEST AC BLACK   GRADE 2

COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	2.9500 0.9192 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	2.7000 0.0 1.	0.0 0.0 0.	1.4000 0.0 1.	1.0000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	1.4500 1.0607 2.	0.5805 0.7501 38.	1.2556 1.1991 9.	0.8600 0.3647 5.	0.0667 0.1155 3.	1.2556 0.8253 9.	0.7200 0.8497 5.	0.0 0.0 0.	0.7500 0.3536 2.	1.5000 0.1414 2.	0.2000 0.0 1.	0.0 0.0 0.
2	0.0 0.0 0.	0.8706 0.7548 17.	1.3147 0.9924 34.	0.7952 0.4050 21.	0.0 0.0 0.	0.0 0.0 0.	0.7944 0.6503 18.	1.2125 0.5866 8.	1.1222 0.8059 9.	0.0 0.0 0.	1.6000 0.0 1.	1.3000 0.0 1.
3	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.2714 0.5510 42.	0.0 0.0 0.	1.2903 0.8390 31.	1.3636 1.0586 11.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.5000 0.0 1.	0.9667 0.3215 3.
4	0.0 0.0 0.	0.0 0.0 0.	0.3000 0.0 1.	0.0 0.0 0.	0.9526 0.6390 19.	1.0413 0.7529 46.	0.0 0.0 0.	0.0 0.0 0.	0.5000 0.0 1.	1.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.4000 0.7071 2.	-0.3000 0.0 1.	0.0 0.0 0.	0.9103 1.1465 29.	0.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	1.3917 0.8204 24.	2.2000 0.0 1.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	0.5000 0.0 2.	1.1000 0.0 1.	0.6667 0.4726 3.	0.9000 0.0 1.	1.0789 0.7800 19.	0.7259 0.5674 27.	1.3469 0.7049 64.	0.7500 0.8193 4.	0.0 0.0 0.	0.8000 0.0 1.	2.1000 0.0 1.
8	0.0 0.0 0.	-0.4000 0.0 1.	0.4437 0.7447 16.	0.2615 0.5347 13.	1.0533 0.6642 30.	0.0 0.0 0.	1.1500 1.0607 2.	0.0 0.0 0.	1.5500 0.6364 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	0.5000 0.0 1.	0.1000 0.2828 2.	1.1000 0.0 1.	0.8793 0.6050 87.	1.6000 0.6083 5.	0.0 0.0 0.	0.3000 0.0 1.	0.0 0.0 0.	1.1500 1.3435 2.	0.0 0.0 0.
10	2.9000 0.0 1.	0.7500 1.0607 2.	0.7400 0.7362 5.	0.3077 0.6962 13.	0.8982 0.6969 55.	0.8452 0.6749 199.	0.7499 0.6945 294.	1.3170 0.7854 212.	0.7615 0.6560 109.	0.7926 0.7726 163.	0.9077 0.7666 221.	1.3208 0.6379 154.
11	1.1600 0.7264 5.	1.1455 0.9363 11.	1.0000 1.0424 7.	0.5622 0.5929 45.	0.9496 0.6152 121.	1.0663 0.8314 101.	1.0095 0.7654 168.	1.0693 0.8826 101.	1.2418 0.8080 232.	1.4538 0.5301 13.	1.4476 0.7658 300.	1.2474 0.6539 228.

MATRIX 14

RANKS ARE BLACK, POST - PRE TEST AC OTHER GRADE 2
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	1.1037 0.7577 3790.	1.0918 0.8204 564.	0.6374 0.8155 139.	0.6120 0.7345 25.	0.9892 0.6872 185.	1.1125 0.7029 112.	0.8935 0.6728 31.	1.0075 0.7590 40.	0.7717 1.0645 46.	1.4000 1.1136 3.	1.1333 0.7371 3.	0.0 0.0 0.
1	1.2725 0.7722 298.	0.8861 0.7158 569.	1.0405 0.6256 79.	1.1444 0.7585 9.	1.0111 0.5345 117.	1.0274 0.7234 95.	0.8738 0.5930 84.	1.3200 0.7823 5.	0.0 0.0 0.	0.8714 0.7690 14.	0.0 0.0 0.	0.0 0.0 0.
2	1.2606 0.7353 33.	1.0944 0.7375 125.	1.1370 0.8474 81.	0.5807 0.7843 88.	1.3000 0.1414 2.	1.0000 0.5657 2.	1.0366 0.6685 41.	1.2633 0.8422 30.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
3	1.0857 0.6440 7.	0.8000 0.0 1.	1.4500 0.3536 2.	0.9793 0.6409 82.	0.8250 0.7848 4.	1.3348 0.8679 23.	1.2857 1.2747 7.	1.6000 0.0 1.	0.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	-0.0667 0.2517 3.	0.2000 0.6083 3.	0.9000 0.0 1.	0.0 0.0 0.	0.5395 0.5253 38.	1.1638 0.6730 58.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.3000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	-2.1000 0.0 1.	2.0000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	-0.3000 0.0 1.	0.0 0.0 0.	0.4750 0.6671 8.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.7000 0.4243 2.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.6667 0.6658 3.	1.3500 1.3435 2.	0.0 0.0 0.	1.2000 0.0 1.	0.8000 0.0 1.	1.1250 0.8396 8.	0.6091 0.5594 11.	1.0857 0.6890 7.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	1.3500 0.0707 2.	0.0 0.0 0.	2.1000 0.0 1.	0.0 0.0 0.	1.0593 0.7592 27.	0.5000 0.0 1.	0.0 0.0 0.	1.0000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	1.7000 0.0 1.	0.0 0.0 0.	1.7000 0.0 1.	0.0 0.0 0.	0.6000 0.0 1.	0.7000 0.4761 4.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	1.4500 0.3536 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.0000 0.0 1.	0.8000 0.8185 3.	0.8500 0.7937 4.	0.0 0.0 0.	0.7000 0.0 1.	0.5800 1.3027 5.	0.0 0.0 0.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

MATRIX 15

RANKS ARE BLACK,   POST - PRE TEST AC SPANISH   GRADE 2
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	1.1920 0.7175 1243.	0.9642 0.7440 134.	0.8370 0.7034 27.	0.6733 0.5106 15.	1.1292 0.6525 39.	0.9917 0.6162 72.	0.7615 0.5440 13.	0.9357 0.9353 14.	1.3625 0.7051 16.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	1.0332 0.7313 238.	1.0656 0.6505 131.	0.7187 0.7910 16.	0.7382 0.6991 68.	0.6714 0.6824 7.	0.7062 0.7878 97.	1.2667 0.5258 18.	1.5200 0.9680 5.	1.0000 0.3536 5.	0.9000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
2	1.1833 0.9024 12.	2.0250 0.5676 8.	1.0604 0.7292 53.	0.8300 0.6800 10.	0.3000 0.0 1.	2.2333 0.5508 3.	0.9684 0.6985 19.	0.8333 0.7194 9.	1.2000 0.3873 9.	1.2000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
3	0.9000 0.5195 3.	0.8000 0.0 1.	0.6000 0.0 1.	1.0476 0.6547 21.	1.8000 0.0 1.	1.2209 1.2529 43.	1.6349 0.9703 23.	0.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	1.1000 1.4142 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.9909 0.7635 11.	0.9533 0.7990 15.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
5	0.2667 0.3786 3.	1.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.8000 0.0 1.	0.9048 0.7526 21.	0.0 0.0 0.	1.0000 0.0 1.	0.0 0.0 0.	1.8167 0.5037 6.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	0.4000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.1182 0.3656 11.	0.9000 0.0 1.	1.3091 0.8561 11.	1.4000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	1.1000 0.2828 2.	0.0 0.0 0.	0.0 0.0 0.	0.4333 0.1528 3.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	0.0 0.0 0.	-0.4000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.0000 0.0 1.	0.5625 0.6802 8.	1.8000 0.0 1.	1.6000 0.0 1.	0.6000 0.0 1.	0.6000 0.9899 2.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

MATRIX 16

RANKS ARE BLACK, ACTUAL - PREDICTED BY BLACK GRADE 2
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	0.0 0.2829 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.5000 0.0 1.	0.0 0.0 0.	-0.4000 0.0 1.	-4.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	-0.2000 2.1213 2.	-0.1263 0.7625 38.	0.2556 0.5763 9.	-0.0400 0.5320 5.	0.4000 0.3606 3.	-0.1667 0.6344 9.	0.1400 0.6504 5.	0.0 0.0 0.	0.5500 0.3536 2.	0.2000 0.2829 2.	-0.1000 0.0 1.	0.0 0.0 0.
2	0.0 0.0 0.	0.1235 0.7005 17.	-0.0089 0.9593 34.	-0.3667 0.8033 21.	0.0 0.0 0.	0.0 0.0 0.	0.3056 0.7803 18.	-0.0500 0.4781 8.	0.1111 0.6173 9.	0.0 0.0 0.	-0.4000 0.0 1.	0.0 0.0 1.
3	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0193 0.5214 42.	0.0 0.0 0.	-0.2903 1.8930 31.	-0.0273 0.5461 11.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	-0.4000 0.0 1.	-0.1333 0.2517 3.
4	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 1.	0.0 0.0 0.	-0.3000 0.9933 19.	0.2804 0.6445 46.	0.0 0.0 0.	0.0 0.0 0.	-0.2000 0.0 1.	0.6000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	-0.6500 0.6364 2.	-1.2000 0.0 1.	0.0 0.0 0.	-0.3517 1.0273 29.	1.0000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	-0.1417 0.7395 24.	1.3000 0.0 1.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	0.3500 0.3536 2.	0.8000 0.0 1.	0.7667 0.7506 3.	-1.0000 0.0 1.	0.3105 0.4852 19.	0.1037 0.5353 27.	0.7562 0.9071 64.	0.1500 0.7000 4.	0.0 0.0 0.	0.8000 0.0 1.	-0.2000 0.0 1.
8	0.0 0.0 0.	-0.5000 0.0 1.	0.0687 0.7190 16.	-0.2000 0.4967 13.	-0.2067 0.4856 30.	0.0 0.0 0.	-0.1000 0.5657 2.	0.0 0.0 0.	-0.0500 0.0707 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	-0.7000 0.0 1.	-0.6500 0.2121 2.	0.0 0.0 1.	0.2471 0.7169 87.	0.4400 1.1283 5.	0.0 0.0 0.	-0.2000 0.0 1.	0.0 0.0 0.	0.8000 1.8385 2.	0.0 0.0 0.
10	1.7000 0.0 1.	0.8500 1.0607 2.	0.2400 1.5143 5.	0.0462 0.6887 13.	0.2236 0.6766 55.	0.0487 0.8316 199.	-0.2412 0.8486 294.	0.3656 0.7583 212.	-0.0670 0.8547 109.	-0.0411 1.6250 163.	0.2561 0.7078 221.	0.2825 0.6822 154.
11	0.1600 0.5914 5.	0.1545 0.6378 11.	0.0571 0.6997 7.	0.0533 0.5925 45.	-0.0215 1.0241 121.	-0.0376 1.0309 101.	-0.1095 0.7086 169.	-0.0099 0.6587 101.	0.2750 0.7450 232.	0.8077 0.9151 13.	0.1917 0.7996 300.	0.0316 0.6652 228.

MATRIX 17

RANKS ARE BLACK. ACTUAL - PREDICTED BY OTHER GRADE 2
COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	0.1634 0.0870 3790.	0.2524 1.0345 564.	0.1353 1.0094 139.	-0.0800 1.3967 25.	0.1506 0.7971 185.	0.1929 0.9026 112.	0.0516 1.0239 31.	0.3675 1.1563 40.	-0.4370 1.4666 46.	1.2667 0.8021 3.	-0.2667 0.2082 3.	0.0 0.0 0.
1	0.1171 1.0197 298.	-0.0160 0.9270 568.	0.1329 0.6925 79.	0.6222 1.0769 9.	0.0068 0.7663 117.	0.1295 0.8038 95.	0.2405 0.9265 94.	0.1000 0.4183 5.	0.0 0.0 0.	0.6786 1.0664 14.	0.0 0.0 0.	0.0 0.0 0.
2	0.4970 0.7295 33.	0.2272 0.8330 125.	0.1481 0.6299 81.	0.1261 1.0424 99.	0.3000 0.1414 2.	0.0500 1.0607 2.	0.1390 0.7134 41.	0.2500 0.9356 30.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
3	-0.0571 1.0359 7.	-0.7000 0.0 1.	-0.1000 0.8485 2.	0.1378 0.7810 82.	-0.6500 1.2557 4.	-0.2652 1.5497 23.	0.2571 0.4284 7.	-0.1000 0.0 1.	0.1000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	0.9000 0.7000 3.	0.3667 0.6658 3.	0.2000 0.0 1.	0.0 0.0 0.	-0.1942 0.9602 38.	0.7121 0.5500 58.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	1.7000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
5	-1.9000 0.0 1.	0.0 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.8000 0.0 1.	0.0 0.0 0.	-0.2625 0.5731 8.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.2000 0.1414 2.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.1333 0.9713 3.	-1.3500 2.3335 2.	0.0 0.0 0.	0.6000 0.0 1.	-0.6000 0.0 1.	0.4750 0.6251 8.	-0.5364 1.3433 11.	1.0857 0.6336 7.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	0.5000 0.8485 2.	0.0 0.0 0.	-3.0000 0.0 1.	0.0 0.0 0.	-0.0899 1.1917 27.	0.6000 0.0 1.	0.0 0.0 0.	-0.2000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	1.7000 0.0 1.	0.0 0.0 0.	-0.3000 0.0 1.	0.0 0.0 0.	0.2000 0.0 1.	0.4000 0.3930 4.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	0.5500 0.0707 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	-0.4000 0.0 1.	0.2667 0.6429 3.	-0.5750 0.2630 4.	0.0 0.0 0.	0.5000 0.0 1.	-0.4800 1.9983 5.	0.0 0.0 0.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

MATRIX 18

RANKS ARE BLACK, ACTUAL - PREDICTED RM SPANISH GRADE 2

COLUMNS ARE THE 1971 RANKS FROM 00 THRU 11 AND THE ROWS ARE THE 1970 RANKS FROM 00 THRU 11

	0	1	2	3	4	5	6	7	8	9	10	11
0	0.2740 0.8429 1248.	0.1463 0.7932 134.	0.1519 0.6386 27.	-0.1200 0.7163 15.	-0.0179 0.5501 39.	0.1264 0.7138 72.	0.2769 0.7247 13.	0.0643 1.0732 14.	-0.1912 0.7432 16.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
1	0.0193 0.9015 238.	0.1809 0.6661 131.	0.1312 0.6041 16.	0.0693 0.6277 69.	-0.1143 0.6094 7.	0.1474 0.5852 97.	0.3000 0.4971 18.	0.0200 0.9576 5.	0.2000 0.6442 5.	0.3000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
2	0.1833 1.7372 12.	-0.3000 0.6000 8.	0.1283 0.6401 53.	0.3700 0.6977 10.	0.0 0.0 1.	0.3333 0.3055 3.	-0.1526 0.5806 19.	0.2222 0.6667 9.	0.0889 0.8695 9.	1.0000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.
3	0.6333 1.2662 3.	0.9000 0.0 1.	-1.4000 0.0 1.	0.0238 0.6811 21.	-0.1000 0.0 1.	-0.6163 1.9442 43.	0.0739 0.8120 23.	0.7000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
4	0.1500 0.7778 2.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.3545 0.7563 11.	0.5267 0.5738 15.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
5	-0.0667 0.4509 3.	0.2000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	-0.7000 0.0 1.	-0.1381 0.4853 21.	0.0 0.0 0.	1.5000 0.0 1.	0.0 0.0 0.	-0.1167 1.2319 6.	0.0 0.0 0.
6	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
7	0.0 0.0 0.	1.0000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.3000 0.5762 11.	0.4000 0.0 1.	0.9273 0.5312 11.	0.2000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
8	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.2000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
9	0.0 0.0 0.	0.0 0.0 0.	1.0000 1.4142 2.	0.0 0.0 0.	0.0 0.0 0.	-0.1667 0.0577 3.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.
10	0.0 0.0 0.	0.5000 0.0 1.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.3000 0.0 1.	0.3375 0.5290 8.	-0.1000 0.0 1.	1.5000 0.0 1.	-0.2000 0.0 1.	0.0500 0.9192 2.	0.0 0.0 0.
11	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.	0.0 0.0 0.

APPENDIX C

BIBLIOGRAPHY

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